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NITRITE OF AMYL.

By Dr. Wm. H. Greene.

A paper on nitrite of amyl by D. B. Dott, read before the B itish Pharmaceutical Conference and published in the "American Journal of Pharmacy," 1878, p. 499, may give some erroneous ideas on the properties of amylic alcohol obtained from fusel oil, and the nitrite derived from it.

Theory indicates the existence of eight isomeric amylic alcohols, six of which are actually known. They are:

(1) Normal primary amylic alcohol: $CH_3-CH_2-CH_2-CH_2-CH_2.OH$

(2) Two normal secondary alcohols: $CH_3-CH_2-CH_2-CH.OH-CH_3$ methylpropylcarbinol.

(3) $CH_3-CH_2-CH.OH-CH_2-CH_3$ diethylcarbinol

(4) Two primary isoamylic alcohols: $\begin{matrix}CH_3\\CH_3\end{matrix}\!\!>\!CH-CH_2-CH_2.OH$ the ordinary alcohol of fusel oil.

(5) $\begin{matrix}CH_3\\CH_2.OH\end{matrix}\!\!>\!CH-CH_2-CH_3$ unknown.

(6) One secondary isoamylic alcohol: $\begin{matrix}CH_3\\CH_3\end{matrix}\!\!>\!CH-CH.OH-CH_3$ methylisopropylcarbinol.

(7) One tertiary alcohol: $\begin{matrix}CH_3\\CH_3\end{matrix}\!\!>\!C.OH-CH_2-CH_3$ ethyldimethyl-carbinol.

(8) One primary alcohol: $\begin{matrix}CH_3\\CH_3\end{matrix}\!\!>\!C<\!\!\begin{matrix}CH_3\\CH_2.OH\end{matrix}$ unknown.

(4) represents the constitution of the amylic alcohol of fermentation. This compound is definite, and when carefully separated from fusel oil by fractional distillation, boils constantly at 132°C. Portions may be obtained which when fractionated in an imperfect apparatus may pass entirely at 128 to 129°C., but if these be subjected to several careful rectifications in a suitable fractionating apparatus, they may be entirely resolved into the alcohol, boiling at 132° and into isobutylic alcohol boiling at 109°.

However, two amylic alcohols do exist in the fusel oil of commerce: one of them is levogyrate and the other is inactive or a mixture of levo- and dextrogyrate alcohols, almost impossible to separate, for their boiling points are very nearly the same. If, however, the mixture be treated with sulphuric acid, two amylsulphuric acids are obtained, of which the barium salts present different solubilities.

It has long been doubtful whether these two alcohols were of the same or different molecular structure, but inasmuch as the active alcohol yields a valerianic acid of which the quinia salt refuses to crystallize, while the quinia salt of the acid obtained from the inactive alcohol crystallizes readily, it may be fairly assumed that the difference is dependent upon chemical constitution.

The recent researches of J. A. Le Bel[1] have considerably elucidated the subject. By subjecting the low residues obtained in the fractionation of propylic (98°C.) and butylic (109°C.) alcohols to fractional distillation in a vacuum, he has succeeded in separating the two amylic alcohols, grace to the greater tension of vapor of the inactive variety.

Are we to conclude that the difference in purity of different samples of nitrite of amyl is due to the mixture of the two alcohols? By no means, for the boiling points of the two isomeric nitrites would not be widely separated.

But, by whatever process nitrite of amyl be made, it is quite possible that its isomeride nitropentane may be formed at the same time, and this would raise the boiling point of the product.

The amylic alcohol which passes after two or three fractionations between 128 and 132°C. can be considered sufficiently pure for all pharmaceutical preparations, and should the nitrite of amyl made from it be of poor quality, a faulty process or carelessness in the rectification must have been the cause.

A very fair yield of nitrite of amyl may be obtained by the action of potassium nitrite and sulphuric acid on the alcohol. The potassium nitrite may be easily made by maintaining potassium nitrate for some time at a dull red heat. It is then heated with amylic alcohol in a flask on a water bath, and sulphuric acid, diluted with its volume of water, gradually added. Nitrite of amyl distils over regularly with some vapor of water. After washing the product with a solution of

[1] *Comptus Rendus.* Tome lxxxvii, p. 213.

potassium carbonate, and drying it with solid potassium carbonate, it is distilled and all that passes below 100° may be retained.

Perfectly pure nitrite of amyl can only be obtained by many and careful fractionations,and would be too expensive for pharmaceutial use. It boils constantly at 96°, the boiling point given by Balard, and its vapor is not dissociated at its boiling point. Mr. Tichborne's statement, made some ten years ago and subsequently contradicted by Chapman, that nitrite of amyl is decomposed by boiling, is erroneous. No gas of any description is evolved during the distillation of amyl nitrite, as can be demonstrated by most rigorous experiment.

It might naturally be expected that there would be a diminution of 5 or 6 per cent. of the portion passing between 90° and 100° at each fractionation. Ten degrees is a very considerable range, and the very fact that Mr. Dott could not get all of his nitrite to pass between 90 and 100°, should have indicated to him that his product was not perfectly pure, but it was gradually approaching purity as shown by the residue left at 100°.

Much time may be saved in fractionating, especially such substances as nitrite of amyl which has a high tension of vapor, by the use of the Le Bel and Henninger apparatus described in the *Comptes Rendus* (vol. lxxiv, p. 480), as two or three fractionations will then effect an almost perfect separation.

I have examined specimens of nitrite of amyl from reputable houses, and have found boiling points between 70 and 180°. Such products, it is needless to say, have never been rectified. The whole result of the action has been distilled and bottled as nitrite of amyl. One specimen had not entirely distilled at 220°; another contained about ten per cent. of water, twenty-five per cent. of amyl nitrite (90 to 100°C)., and the remainder was composed almost entirely of unaltered amylic alcohol.

The boiling point of the nitropentane derived from ordinary amylic acid is in the neighborhood of 160°C. I have found traces of it in all of the commercial nitrite of amyl I have examined; and sometimes the proportion is not inconsiderable. It may be detected by subjecting that portion which passes between 150 and 170°C. to the action of nascent hydrogen. Amylamine is thus formed. Commercial amyl nitrite seems also to contain very small quantities of nitrate of amyl.

1129 *Cherry Street, Philadelphia.*

ORANGE FLOWERS AND ORANGES FROM THE SOUTHERN STATES.

By W. B. Rush.

Read at the Pharmaceutical Meeting, January 21.

Flowers and fruits of Citrus aurantium and of Citrus vulgaris, nat. order, *Aurantiaceae*. Anthers, twenty; calyx, five-cleft; petals, five; fruit containing about nine cells.

This interesting genus is composed of small, evergreen, much-branched trees, growing about 15 feet high, and having coriaceous, ovate, shining leaves, and odoriferous flowers and fruits, which combine beauty and color with pleasant taste and odor. The leaves are pale green and, when bruised, have a very fragrant odor and a warm, pungent taste. They contain volatile oil.

Of the eight species of Citrus, yielding interesting flowers and fruit, the sweet and sour oranges, limes, shaddocks, lemons and citrons are the ones interesting to us. The flowers, which have a delightful odor, are large, white and attached by short peduncles simply or in clusters to the smallest branches. The petals are oblong, white, concave and beset with numerous small glands. The filaments are united at their base in three or more distinct groups and support yellow anthers. The calyx is saucer-shaped with pointed teeth. The flowers in the several varieties differ in color and odor. The orange flowers are of a creamy white; those of the limes and lemons violet-blue, and of the citrons and shaddocks same as the oranges. The sour or wild orange flowers possess the largest amount of volatile oil.

The writer has had some experience in orange culture, extending over a period of two years, at New Orleans, and closely watched the different stages of growth from seed to the full bearing tree.

In Florida the orange, lemon and lime grow wild and are found in abundance. In Lousiana and Mississippi they are grown from the seed. The seeds are planted in early spring or in hot-beds in January. When one year old, they are transplanted in a nursery arrangement. At the age of two and a half years, they are budded, i. e., the seedlings are of the sour variety, and to produce sweet oranges fully matured buds are taken from bearing trees and inserted. This is done to render the tree more hardy, since the sweet seedlings are subject to a root disease called heel, while the sour seedlings are not. Hence, orange growers resort to this means to produce sweet oranges. The

trees are transplanted at the age of four years into orchards. At the age of six, flowers first appear, and at ten years the trees are called full bearers.

This beautiful evergreen is found in every civilized country where the climate is favorable, and in colder countries it is the cherished ornament of the hot-house. It flourishes in our most southern limits, largely in Florida, and to a considerable extent in Mississippi and Louisiana, south of the lakes. In Mississippi and Louisiana they are favored by the lakes tempering the cold north winds. There seems but little difference between these States in their favorable localities. However, the tree requires delicate cultivation and studied treatment. About the year 1816 oranges were introduced as ornaments to this country by the French. In 1830 an orange tree in a box, in bloom, brought 400 francs, and about this time some attention was paid by horticulturists, and blooming trees in boxes were sold at from 50 to 100 francs in New Orleans. The beginning of the cultivation of oranges for fruit, in the South, dates back to 1848, when numbers of trees were planted, but in January, 1856, a cold wave from Texas brought the temperature down to 19° F. above zero, and a large proportion of the trees were killed. Not much attention was paid to the cultivation afterwards until 1867 and '68, and since then orange growing has been quite successful and assumed commercial importance.

The orange family afford the pharmacist two important articles—flowers and fruit. From flowers we obtain oil of neroli and orange flower water, and from the fruit we have the volatile oil of the rind, the juice of the pulp and, last but not least, citric acid.

As the orange tree is so little known in the North, a brief account will not be out of place. Owing to unfavorable conditions in cold climates, the beauty of foliage, the very grateful odor of the flowers and the delicious fruits are very imperfect in comparison to those localities where the trees attain perfection. The fruit, as it comes from Florida, is a good representation. The oil which is made from the rind is generally less agreeable. The oil of the flowers has only a faint resemblance to the odor of the flowers, and the orange-flower waters, as usually sold, have but little of the delicate odor of the fresh petals. Prof. Remington exhibited a specimen of oil of neroli which, after being exposed on cloth a short time, gave the true odor of the petals, with some aridity. This was considered, and doubtless was, a choice

specimen, but other varieties are probably made from whole flowers, branches and young fruit.

The time of flowering is from the beginning of February until the tenth of April, in healthy trees; unhealthy ones are found in bloom sooner or later. The last week of February finds most of the trees blooming. The petals remain on the flowers for about two weeks. Unfavorable conditions shorten the time. The humidity of the atmosphere materially affects the flowers—when too wet the pollen heads are injured and the secretions are imperfect. Dryness has a similar effect on the pollen and nectar, but does not affect the secretion of oil. When the temperature is too low, but few flowers are fructified, the oil cells are limpid and no nectar is secreted. The most favorable temperature is about 68 to 76°F. Under 60°F. flowers are blighted. When the busy bee is found collecting the nectar, the conditions are favorable for the development of flowers and fruit, and then the flowers contain their most agreeable odor.

An ordinary tree will yield from two to ten pounds of flowers, ordinarily about seven. As soon as the petals begin to fall a canvas is spread under the tree and by brisk shaking the petals will fall, with some leaves, which are easily separated. The time when flowers are most fragrant is early in the morning, and late in the day the odor is greatly diminished. Prior to the late conflict, negroes collected and sold orange petals in New Orleans. A tea-saucer full (about 2 ozs.) was measured out, put upon a china plate and set in the room, for which the negro received about fifty cents. From two to three plates would perfume a room for a week. Orange flowers produced in the extreme southern borders are believed to possess a stronger odor and more oil. The difference is accounted for in this manner: In the tropics and semi-tropics the trees do not begin to bear very much until about twenty years old, while in this country they begin at about seven. The development is more rapid, the tree more vigorous, and it is reasonable to suppose a better development of odor in the flower. The writer was informed by an orange grower who had extensive observations in different countries and fully confirmed this supposition. The flowers are more fragrant and the fruit more juicy, but not so sweet as in some other countries.

The pharmacist buys the products of the orange from over the sea. That oft used name *imported* always adds an imaginary value of

more than a hundred per cent. It is said to pay the producer of California wines to send his wine to France and, having the label changed and translated into French, bring it back here, pay freights and double duty, and then realize one hundred per cent. on the transfers, because the consumer considers it far superior to our wine. Just so with our neroli and the orange-flower water and fruit juices. Almost all the crude material for citric acid is imported. This need not be. There is abundance to be had in the South. Florida furnishes flowers sufficient for America for the oil of neroli, orange-flower water, citric acid, fruit juice and oils of the rind, and if no misfortune happens to the sweet orange plantations, there will soon be fruit sufficient for the United States from the first of November until May.

The writer made several experiments with orange flowers. When placed in the direct sunlight, in the course of two days they lose all their odor. In diffused daylight they retain it for at least three days, and in a dark, humid atmosphere the odor is quite distinct after one week. When bruised, they lose their odor in half of the time stated. The writer had no means for experimenting as to amount of volatile oil, but he believes that the better plan for the pharmasist is to have the petals hermetically sealed and to make his preparations direct.

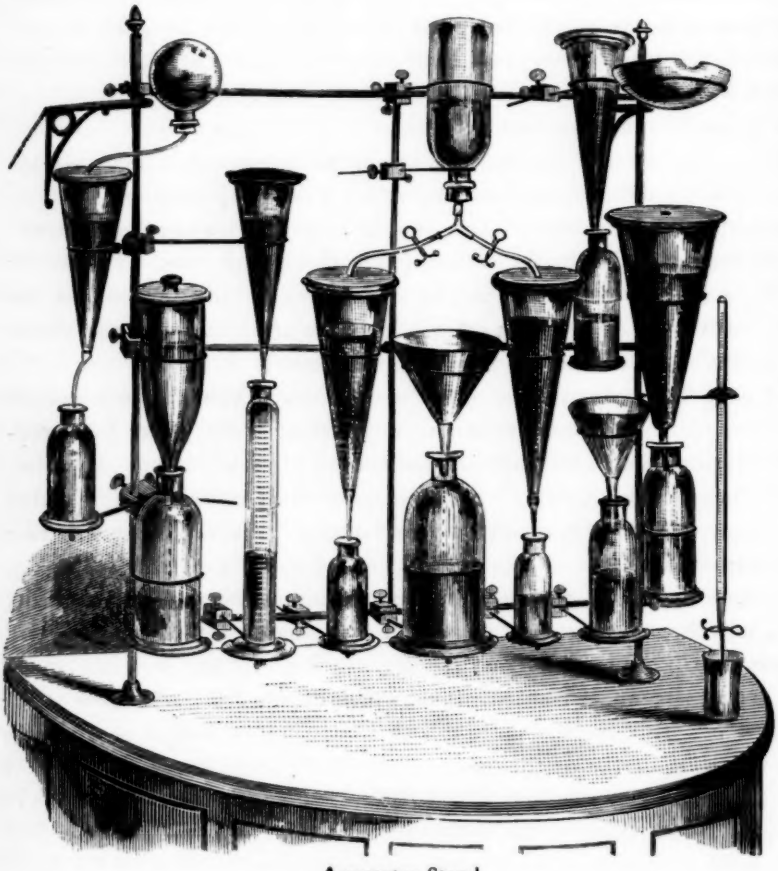
Orange-flower water is one of the most agreeable vehicles for nauseous medicines that we have, and when the pharmacist can make fresh preparations they will be fully appreciated and the expense will not be greater. The syrup of either flower or fruit has no superior, especially the syrup of the fruit. A honey collected from orange flowers is very fragrant with the orange odor. The flowers, placed in tin cans and sealed up, are known to have retained their odor unimpaired for nine months. As a perfume they have no equal. To sit under a tree when in full bloom is delightful—the fragrance intoxicating. If any one has made the syrup of orange from the fresh juice of the fruit and used it, he will not want to use any more which is made from simple syrup and a few drops of the oil of the rind.

APPARATUS STAND.

By Alonzo Robbins.

Read at the Pharmaceutical Meeting January 21.

The apparatus stand shown in the accompanying wood-cut was devised for my own use, and a year's constant employment of it has fully proved its utility; great strength, with extreme lightness of form, is by no means its least recommendation.



Apparatus Stand.

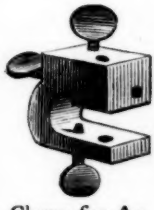
Owing to the total absence of unoccupied wall space, I was obliged to place it in front of shelving containing small bottles; yet, even when

the stand was loaded with apparatus, as shown in the engraving, very little inconvenience was felt in using the bottles on the shelves.

The stand was placed on a semi-circular table 65 inches long, 28 inches wide in the centre, and 33 inches high; the lower part of this table is divided into three very convenient closets, and, as shown in the cut, the top is left entirely free, and may be used as a writing table.

The table and closets are neatly made of black walnut, and, with the stand and percolating apparatus it contains, are rather an ornament to the prescription department, besides furnishing ocular evidence of the home manufacture of fluid extracts, etc.

The various parts are all extremely simple, and I have endeavored to make the following description of them plain enough to enable any machinist to make the stand.



Clamp for Apparatus Stand.

The clamp is the most important part; it is made of brass, and is 2 inches long, $1\frac{1}{8}$ inch wide and $1\frac{1}{2}$ inch high, with a $\frac{1}{4}$ inch elevation opposite the slot. The slot is just large enough to allow the clamp to be slipped on the iron rods; the clamp also contains two smaller holes, bored all the way through, for the stems of the rings and the small ends of the rods. It is held firmly in place by means of thumb-screws —a separate cut is given showing it more in detail than could be done on the large illustration.

The remaining parts are two iron rods, nine-sixteenths of an inch in diameter and 48 inches long; a 1-inch screw is cut on one end of each of these rods.

Four iron rods of the same diameter and 42 inches long; two inches of each end of these four rods is turned down on a lathe to five-sixteenths of an inch diameter.

Two $2\frac{1}{2}$ inch circular brass feet, to screw on the lower ends of the 48-inch rods.

Two pieces of brass $\frac{1}{2}$ inch thick, $1\frac{1}{8}$ inch wide and $7\frac{1}{2}$ inches long, with a round hole in one end to slip over the top of the 48-inch rod, and a square hole in the other end, through which a screw bolt is passed to secure it to the shelf. Should there be no shelving where the stand is set up, an L-shaped bracket must be used instead of this straight piece.

The rings are made of five-sixteenth inch iron, and are from 1 to 10

inches in diameter; the stems range in length from 4 inches on the 10-inch rings to 9 inches on the 1-inch.

The stand is to be erected by first screwing the brass feet to the table at the proper distance apart, then attach the long iron rods and slip the brass brackets over the top; fasten them each firmly to the shelf with a screw bolt and nut; next place a clamp on each end of one of the 42-inch rods, and attach it to the uprights 2 inches from the top; attach another rod in the same manner 8 inches from the bottom, and one at an equal distance between the other two; the remaining rod is attached in an upright position to the top and bottom rods. The clamps for holding the rings may be put on either the upright or horizontal rods wherever most convenient; there is also one hole unoccupied in each clamp used in setting up the large rods.

I had also a number of circular blocks of walnut wood, turned with a half-inch raised edge; these were of various diameters, and were used as stands for the receiving bottles during percolation. They were secured to the rings by small bolts with thumb-screws. These blocks also answered admirably as covers for funnels and percolators, the small hole in the centre admitting the rubber tube for automatic supply of menstruum.

The rings conveniently hold evaporating dishes and cloth strainers, and the smallest size makes a good burette holder. Any of the various pieces of Dr. Squibb's apparatus stand may be used on the upright rods.

The stand is capable of many changes in addition to those shown in the cut, and can be reduced to a single upright rod, a few clamps and rings, or indefinitely extended as the needs of the operator may require.

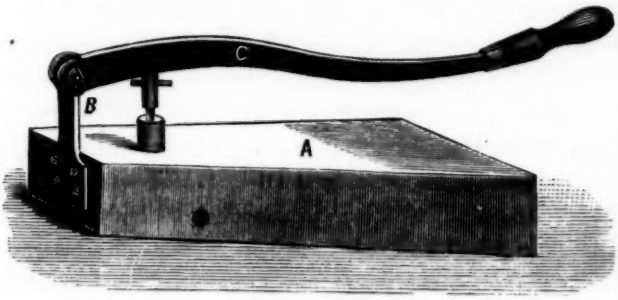
IMPROVEMENT IN PILL COMPRESSING.

By Bennett L. Smedley.

In the many mechanical aids to the busy druggists, which of late years have so greatly lightened his labor and simplified the process of preparing remedies in more elegant form, none surpass the pill compressing machine.

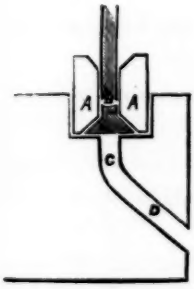
The complex mechanism at first employed has now been simplified as far as is apparently desirable, and pills of varying composition can

now be made in a form at once compact, small in size, and free from foreign matter heretofore necessary to hold the mass together.



Apparatus for compressing Pills.

Having experienced difficulty in removing the pill from the compressor at times without breaking it, I have designed the apparatus rep resented in the above cut, a sectional view of which is given in the cut below. Its operation being so successful in producing a pill at once perfect and with the least expenditure of power, has induced me to offer a brief description of it to the readers of the "Journal." It can be constructed at a small cost, and after the necessary patterns have been made, can be furnished for $3.50, exclusive of the compressor, or at $6.00, including two sets of compressors for three and five grain pills.



Section through Cylinder.

"A" is a block of hard wood 16 inchos long, 7 inches wide at one end, tapering uniformly to 5 inches at the other end. It is 3 inches thick throughout. A hole is sunk at a point 2⅜ inches from the smaller end of the block, in its central line, to receive the compressing cylinder. At the bottom of this hole an iron washer is fitted. The depth of the washer is ¾ of an inch. From the bottom of the hole a central tube is bored for an additional ¾ of an inch, at which point it is met by a similar tube bored through the side of the block. Through this tube, which slopes sufficiently to permit its passage, the pill escapes.

An upright, "B," 4 inches high is screwed firmly to the smaller end of the block, and to its upper end is attached by a hinge joint the lever "C," 24 inches long. The iron in each one is 1 inch

wide, and half an inch thick. The lever is slightly countersunk at the point where it touches the head of the compressing rod to admit of lateral motion.

The second figure presents a transverse section through the cylinder. "A" is the hole admitting the cylinder, between the upper and lower segments of which a pill is shown at "B." "C" is the outlet tube emerging at "D." The action of the apparatus is apparent. The pill having been compressed, the lever is raised sufficiently to permit the removal of the lower segment of the cylinder, when a slight pressure of the lever will force the pill from the tube and it will emerge at "D" in a perfect condition.

Philadelphia, January, 1879.

ADULTERATION OF POTASSIUM IODIDE.

By C. E. DePuy, Ph. G.

Not long since a sample of potassium iodide bearing the label of a western manufacturer came under my notice, which from its appearance I suspected was adulterated.

Its crystals were not of the form so characteristic of a pure drug, but on the contrary were of an irregular formation, traversed in all directions by deep fissures which enabled them to be easily broken with the fingers, while its odor was strong and offensive.

To more fully determine its real character, I applied tests, with the following results:

Alcohol of the sp. gr. 835 dissolved but about 50 per cent. of the salt.

With tartaric acid and starch no change took place until several hours after, when a brownish precipitate was deposited.

With starch, black oxide of manganese and sulphuric acid cautiously added at first produced a blueish tinge, which soon changed to a dark brown color.

With chlorine water and starch a similar reaction occurred.

With nitrate of silver a copious yellowish white precipitate was obtained. This precipitate, when treated first with nitric acid and then with ammonia, was placed upon a filter, and to the filtrate was added nitric acid in excess, by which means a very small white precipitate was obtained.

By the addition of a solution containing two parts of ferrous sulphate to one of cupric sulphate, a dirty white precipitate was the result.

With ferrous sulphate a small reddish flocculent precipitate was produced.

Lime water gave a slight turbidness, while a saccharated solution of lime produced a small white precipitate.

All tests to the contrary proved the absence of other salts than potassium.

From the foregoing results I concluded that the drug under examination consisted of a mixture of the iodide, bromide, chloride and carbonate of potassium. When upon carefully separating the several radicals in the form of Cu_2I_2, AgBr, AgCl and $CaCO_3$ (operating each time upon 10 grains of the salt), I found them existing in the following proportions: Iodine 3 grains, bromine 3·89 grains, chlorine and carbonic acid each traces.

The equivalents of these, in combination with potassium, being (to 10 grains) potassium bromide 5·78, potassium iodide 3·29, potassium chloride a trace, and potassium carbonate a trace.

Chelsea, Michigan, January 12th, 1879.

CHEMICAL NOTES.

By Prof. S. P. Sadtler.

New Elements.—*On the New Element Philippium.*—Delafontaine, who had announced last year the existence of a fourth earth in the mineral samarskite, now gives a fuller and more exact account of his discovery. He names the new element *Philippium*, after Philippe Plantamour of Geneva. Its oxide is yellow, and has a molecular weight between 90 and 95, standing intermediate between yttria and terbia (YO=74·5, TbO=114). Philippium formate is easily crystallizable and less soluble than yttrium formate. The philippium oxalate is more soluble in nitric acid than the terbium salt, less so than that of yttrium. Concentrated solutions of philippium show a spectrum containing a magnificent absorption band in the indigo (λ=about 450), very intense, tolerably broad, with sharply-defined edges, especially upon the right side. This band is characteristic of philippium, not being found in the spectra of terbium, yttrium or erbium. Two other narrow bands occur in the green, of which the more refrangible appears to belong to erbium, the other, however, to philippium. A weak band

in the violet (λ=400 to 405), attributed by Soret to terbium, the author thinks may belong to a new element coming between terbium and erbium.—*C. R.*, 87, 559.

On the New Element Decipium.—Delafontaine announces the discovery of a second new element in the mineral samarskite from North Carolina, to which he gives the name *Decipium*, from *decipiens*, deceiving. The protoxide, DpO, has a molecular weight of 122; as it has not yet been obtained perfectly free from didymium oxide, the author cannot say whether its oxide is white, though its salts are colorless; the acetate crystallizes easily, being less soluble than that of didymium, but more so than that of terbium. The nitrate gives an absorption spectrum consisting of three bands in the blue and indigo. The most refrangible of these is less broad than that of philippium, is dark, and corresponds to a wave length near 416, being about half way between G. and H. The second band corresponds to a wave length of 478. Finally, a little to the right, and nearly to the limit of the blue and green, is an appearance of the third. The earths of samarskite, as now known, are given by the author in the following tabular form:

Name.	Color.	Molec. weight.		Wave length of band.
Yttria	White	YO=74·5	(Delafontaine)	none.
Philippia	Yellow	PpO=90 about	(Delafontaine)	449 about.
Didymia	Brownish	DiO=112 to 114	(Marignac-Clève)	572 to 577.
Terbia	Orange	TbO=114 to 115	(Delafontaine-Marignac)	400 about.
Decipia	White?	DpO=122 about	(Delafontaine)	416.
Erbia	Rose	ErO=130	(Bunsen-Clève)	520 to 522.
Thoria	White	ThO_2=267·5	(Delafontaine)	none.
Ceria	Pale yellow.			

—*C. R.*, 87, 632.

On the New Element Ytterbium.—Marignac has announced the existence of a new element in gadolinite from Ytterby, Sweden, where it is found associated with yttrium and erbium. The earth was gotten perfectly white, forming colorless salts, and showing no absorption bands in its spectrum. The purest preparation of oxide possessed a molecular weight of 130·8, so that Marignac assumes 131 as the molecular weight of the purified oxide. Its sulphate is easily soluble without residue in a saturated solution of potassium sulphate. All of these properties easily distinguish it from thoria, which is the only

earth which could in this case raise the equivalent of the erbia. Probably the equivalent of this latter earth has hitherto been placed too high. Taking the molecular weight of the Ytterbia as 131, the atomic weight would be 115 or 172·5, according as the oxide is YbO or Yb_2O_3. —*C. R.*, 87, 578.

On the New Element Mosandrum.—J. Lawrence Smith, of Louisville, Ky., has sent a sealed note to the French Academy of Sciences, where it was read November 25th, 1878, in which he claims priority for his metal mosandrum over Delafontaine's announcement of philippium. Delafontaine published a rejoinder (C. R., 87. 400) in which he asserts that Smith's characterization of mosandrum was so vague that it might have applied to any mixture of the earths of this group occurring in samarskite, and that September 22d, 1877, Smith had no suspicion even of the existence of Philippium.

On the Probable Composite Character of Didymium.—Since the time of Mosander, didymium has been regarded as a single element. Delafontaine, however, after examining the spectrum of didymium solutions prepared from cerite and the spectrum of didymium solutions prepared from samarskite, finds the latter much simpler, containing fewer lines than the former. After comparing this didymium spectrum (from cerite) with the spectra of terbium and decipium, he regards it as very probable that cerite contains at least one new element, not as yet isolated, which would explain the lines not found in the spectrum of didymium from samarskite.—*C. R.*, 87. 634.

Miscellaneous.—*Chemical Notes from the Paris Exhibition.*—*Aluminium*, prepared from bauxite, was displayed in large bars. The price was 50 francs per kilogram. *Thallium* was also shown in large blocks, preserved under water, and constituted one of the most interesting objects shown in the chemical line. *Iodine* preparations, derived from the iodine of sea-weeds, were shown in abundance. A note accompanying them gave the cost of iodine as follows: extraction of one kilogram of iodine, 2 francs; purifying the same, 2 francs; total cost of one kilogram purified iodine 4 francs. A number of French chemical establishments make a speciality of working up the *beet-root molasses* for potash salts. According to reliable information, 18 facto-

ries use yearly some 25,000 tons of molasses-ashes from which they obtain 10,000 tons of refined potash, which are used in soap manufacture, in flint-glass works and in the preparation of yellow prussiate of potash. According to a report made on the ultramarine exhibited at Paris, the yearly production of Europe is now more than 10 million kilograms, sold at an average price of 2 francs per kilogram. (The blue prepared from Lapis lazuli as late as 1820, cost 4000 francs per kilogram).—*Chem. Industrie*, Sept., Oct. and Nov., 1878.

On the Determination of Nitrogen as Ammonia.—A. E. Grete states that he is able to obtain the theoretical amount of ammonia in the ignition of nitrates with soda-lime by mixing with the soda-lime potassium xanthogenate (obtained by mixing carbon bisulphide with alcoholic solution of potassium hydrate). This compound, $CS_2KOC_2H_5$, when heated with the soda-lime, yields hydrogen sulphide in *statu nascendi*, by the aid of which the nitrate is completely reduced to ammonia. The author has applied this method also to the determination of nitrogen in various albuminoids, and finds that for the first time the full theoretical amount of nitrogen can be gotten in their analysis.—*Ber. der Chem. Ges.*, xi, pp. 1557 and 1558.

On the Supposed Existence of Chrysophanic Acid in Goa Powder.—Liebermann and Siedler find that in the drug known as Goa or araroba powder, in which Attfield ("Phar. Jour. and Trans.," 1875, p. 721, "Amer. Jour. Phar.," 1875, p. 330) found, along with 2 per cent. resin, 5·5 per cent. woody fibre and 7 per cent. bitter extractive matter, 80 to 84 per cent. chrysophanic acid, there exists no chrysophanic acid at all, but a substance easily converted into it. This substance they call *Chrysarobin*, and give to it the formula $C_{30}H_{26}O_7$. If this be treated with an excess of potassium hydrate and air be conducted into the mixture, at the same time the chrysarobin is oxydized to chrysophanic acid, the potassium salt of which forms

$$C_{30}H_{26}O_7+2O_2=3H_2O+2C_{15}H_{10}O_4.$$

—*Ber. der Chem. Ges.*, xi, 1603.

GLEANINGS FROM THE GERMAN JOURNALS.

By Louis von Cotzhausen, Ph.G.

Cinchotenicia.—On dissolving one molecule of cinchotenia, a derivative of cinchonia, in dilute sulphuric acid containing one molecule of H_2SO_4, and evaporating this solution at a moderate heat, an amorphous residue was obtained by O. Hesse, which, after fully drying at 120°C. became crystalline, still apparently consisting of cinchotenia-sulphate. If this is heated to 140 to 150°C., or is melted, it will be transformed into amorphous cinchotenicia-sulphate, aad still retain almost the same weight, but assumes a dark-brown color. By dissolving it in water, removing the sulphuric acid by baryta-water, and the excess of baryta by carbonic acid, a brownish-yellow solution of cinchotenicia is obtained, which, after treatment with animal charcoal and evaporation, leaves dark-brown, amorphous cinchotenicia; after powdering, it is yellow, dissolves readily in cold and hot water, alcohol, chloroform, diluted acids, ammonia, potassa or soda, but is insoluble in ether. Its brownish-yellow, bitter solution in water rotates polarized light to the right. It yields the characteristic reactions of alkaloids, melts at 153°C., is decomposed at 180°C., and differs from cinchotenia in being more easily acted upon by boiling nitric acid.—*Ber. d. Deutsch. Chem. Ges.*, 1878, p. 1983.

Quinia-Carbolate of Commerce, according to the statement of Dr. Biel, is always a sulpho-carbolate, as can be proved by melting it on platinum foil with soda and saltpetre, when the resulting mass, dissolved in dilute nitric acid, will yield a strong reaction for sulphuric acid.—*Pharm. Ztschr. f. Russl.*, Oct. 15, 1878, p. 616.

Substitutes for Cinchona Barks. *Alstonia constricta.*—The bark was analyzed by Palm, who found it not to contain a trace of quinia, the presence of which had been asserted. He isolated, however, a bitter principle, *alstonin*, which is not an alkaloid and not in the least similar to quinia.

Alstonia scholaris, R. Br.—According to O. Hesse, the bark which is known as dita bark does not contain 5 per cent. of an alkaloid similar to quinia, as alleged by Gruppe, but contains 0·02 per cent. of *ditamia*, an alkaloid soluble in ether, and another alkaloid, *echitamia*, crystallizing with oxalic acid, and soluble in concentrated H_2SO_4.

A. spectabilis, R. Br.—The bark is used as a fever-medicine in Java

and contains an alkaloid which Hesse calls *alstonamia*. It differs from ditamia principally in being crystalizable.

Crossopteryx Kotschyana, Henzl., s. *C. febrifuga*, Afzelius, Nat. Ord. Rubiaceæ, is indigenous to Abysinnia. The bark was analyzed by Hesse, who isolated from 20 grams of the bark 3·6 mg. = 0·018 per cent. of an alkaloid which Hesse calls *crossopteria*. It is soluble in ether, alcohol and diluted hydrochloric acid, and does not resemble the cinchona alkaloids.—*Ber. Deutsch. Chem. Ges.*, 1878, p. 1546.

Symplocos Racemosa, lotur-bark, indigenous to India, considered by Winckler identical with Batka's China californica, was analyzed by O. Hesse, who found it to contain 0·24 per cent. of *loturia*, 0·02 per cent. *colloturia* and 0·06 *loturidia*—three different alkaloids. *Loturia* crystallizes in brilliant, very long, smooth prisms, efflorescing in the air, is soluble in acetone, ether, alcohol and chloroform; insoluble in water, ammonia or soda; melts at 234°C., and completely neutralizes acids. *Colloturia* crystallizes in long, brilliant prisms, from alcohol, and in granules from ether, and is not efflorescing in the air; its solutions in diluted mineral acids possess a blueish-violet fluorescence. *Loturidia* solutions have the same fluorescence. The alkaloid forms amorphous compounds with nitric and hydrochloric acids, which are very soluble in water. The bitter principle isolated by Winckler from the bark, and called *californin*, is considered by Hesse to have been a mixture of the acetates of the three alkaloids found by him.—*Ber. d. Deutsch. Chem. Ges.*, 1878, p. 1542.

Adulterations and Substitutions of Angustura Bark.—Oberlin and Schlagdenhauffen publish the following distinction between genuine Angustura-bark and other barks used as adulterations and substitutions:

1. *Genuine Angustura bark* is found in the market in either nearly flat, slightly curved or quilled pieces, pared towards the edges, 2 or 3 millimeters (about $\frac{1}{8}$ inch) in thickness, differing in length and possessing a characteristic odor and a bitter taste. The pieces swell to two or three times their original size when macerated in water, becoming soft and easily divided in a logitudinal direction; when dry, the bark has a short, resinous fracture, and a grayish-yellow or dirty white, more or less spongy or compact outer surface, while the inner bark is pale yellow, smooth or longitudinally striate.

2. *Nux-vomica bark*, known as "*False Angustura bark.*"—When from the stem it is of an irregular shape, covered with a dense, spongy rust

or orange-colored layer. The bark from the branches is curved, has a dark-gray corky layer, from which numerous white warts protrude, and comes in solid pieces not pared towards the edges.

3. *Brazilian Angustura bark*[1] consists of slightly curved pieces, 20 to 25 cc. (8 to 10 inches) in length, and 1 to 1½ mm. (about $\frac{1}{16}$ inch) in thickness. It possesses a lasting bitter taste, does not swell in water, is often covered with an ash-gray layer, occasionally with extraordinarily strongly developed warts, and is always marked with longitudinal red or black spots on a yellow ground. The inside of the bark is red, and has paler, distinct, elongated fibres.

4. *Guaiacum bark.*—Flat or slightly curved, very hard and compact pieces, 4 to 6 mm. (about $\frac{1}{5}$ inch) in thickness, covered with a brown-gray, corky layer, partially peeling off, and having a smooth, whitish-gray bast.

5. *Copalchi bark.*—Long, cylindrical quills, 2 to 6 mm. ($\frac{1}{12}$ to $\frac{1}{5}$ inch) in thickness, covered with a corky layer, whitish or light yellow, dense, hard, compact; bast reddish-brown, fracture coarse and irregular. The odor of the powdered bark is terebinthinous and its taste strong and bitter.

6. *Cinchona bicolorata* or *Tecamez.*—Flat, curved or quilled pieces, 7 to 30 cc. (3 to 12 inches) in length, and 1 to 2 mm. ($\frac{1}{25}$ to $\frac{1}{12}$ inch) in thickness, externally smooth or somewhat wrinkled, variable in color; the middle layer is cinnamon-brown, the inner surface is longitudinally striate, and the bast layer very thin.

7. *Bark of Samadera Indica.*—Voluminous, slightly curved pieces, having a yellow or brown corky layer and a fibrous bast; the inner layer is darker than the bark-parenchyma.—*Pharm. Ztg.*, Dec. 11, 1878, p. 853.

Adulterated Kamala.—A sample of Kamala imported from India consisted of a reddish-brown, heavy powder, appearing under the microscope as transparent masses, and of white amorphous and crystalline bodies. It left 79·5 per cent. of ashes, and as analyzed by A. Kremel was found to be adulterated with a silicate, very probably red bole.

Another more interesting sample was exhibited at Vienna by Dr.

[1] The bark of *Esenbeckia febrifuga*, Mart'us. See "Amer. Jour. of Phar.," 1874, pp. 50 and 414.—EDITOR.

Bidier, of Madras, and labelled "Kamala, Rotlera tinctoria, Roxb." It was a reddish-brown, hygroscopic, light powder, had a peculiar strong odor, and on examination proved to be merely the dried and powdered flowers of Carthamus tinctorius, partially destroyed by insects and mixed with them. This so-called kamala contained 11·8 per cent. of water and left 9·7 per cent. of ashes. Several other samples obtained in Vienna were more or less pure, containing from 2·7 to 4·2 per cent. of water, and leaving from 8·4 to 22·8 per cent. of ashes.—*Ztschr. d. Oest. Ap. Ver.*, Nov. 20, 1878, p. 527.

Chemical Constitution of Rhamnetin and Xanthorhamnin.—Derivatives of xanthorhamnin and rhamnetin were made on a large scale and carefully purified and crystallized. Comparative analyses of these crystals convinced Liebermann and Hoermann that Schuetzenberger's formula for rhamnetin, $C_{12}H_{10}O_5$, is correct, and that his formula for xanthorhamnin, $C_{24}H_{32}O_{14}$, should be changed to $C_{48}H_{66}O_{29}$.—*Ber. d. Deutsch. Chem. Ges.*, 1878, p. 1618.

Malabar Kino and Kinoïn, a New Constituent thereof.—On extracting Malabar kino with ether a colorless crystalline substance is obtained, which C. Etti proposes to call *kinoïn*. The same substance is obtained in a more economical manner by the following process: To boiling dilute hydrochloric acid (1 : 5) add one-half its weight of kino and remove from the fire, when kinic red will immediately separate as a soft mass, which gradually solidifies, while kinoïn slightly impure will remain in solution. The kinic red still contains some kinoïn, which may be obtained by repeated boiling with water; the decoctions are mixed, the kinoïn removed by shaking with ether, the latter evaporated and the crystals of kinoïn purified by repeated crystallizations from boiling water. Etti obtained thus from 1 kilo of kino 15 grams of pure colorless kinoïn, which is nearly insoluble in cold, readily soluble in boiling water and alcohol, and has the composition $C_{14}H_{12}O_6$.—*Ber. d. Deutsch. Chem. Ges.*, XI., Nov. 11, 1878, p. 1878.

Extractum Tamarindorum Purum, s. Mellago Tamarindorum.—This is an extract concentrated in the vacuo, introduced by Chas. Erba, and highly recommended as a pleasant laxative in the dose of three to four tablespoonfuls, and, dissolved in water, as a refreshing drink in inflammatory and febrile diseases. It is a much more elegant preparation than the pulp of tamarinds, has the consistence of honey (hence the name

mellago), is clear, not stringy, possesses a brownish-red color, makes a clear solution with water, and has a pleasant sweetish-sour taste.—*Pharm. Centralh.*, Dec. 5, 1878, p. 459.

Boracic and Boro-carbolic Lint and Cotton as Antiseptics.—Ed. Solger makes boracic lint and cotton, of different strength, by saturating the fabric with a solution of 10, 15 or 20 parts of boracic acid in 90, 85 or 80 of hot water. This mixture, which usually deposits crystals on cooling, is heated to 50°C. so as to re-dissolve the crystals before using, and the saturated lint or cotton is applied as a bandage before cooling.

Boro-carbolic lint and cotton is made in a similar manner, using a solution of 5 or 10 parts of boracic acid and 2 parts of pure carbolic acid in 100 parts of hot water and 5 parts of alcohol.—*Ibid.*, p. 482.

Preparation of Vanillin from Siam Benzoin.—Chr. Rump gives the following directions for preparing vanillin: Two parts of powdered Siam benzoin and 1 part of slaked lime are boiled with water in an iron kettle, stirring constantly; the resulting solution of benzoate of calcium is filtered, the filtrate acidulated with hydrochloric or sulphuric acid, the precipitated benzoic acid separated by filtration, the acid filtrate shaken with ether and the ether evaporated spontaneously. The impure vanillin thus obtained is purified by re-crystallization from water, from which it separates in long, thick white needles, turning yellow on exposure to the air. It is very soluble in ether, alcohol, chloroform, glacial acetic acid and slightly in cold benzol, crystallizing from all these solvents in well-developed prismatic crystals.—*Ber. d. Deutch. Chem. Ges.*, 1878, p. 1634.

Benzoic Acid Containing Cinnamic Acid.—G. Reichardt examined three different lots of commercial benzoic acid, and found each to contain a considerable proportion of cinnamic acid.—*Pharm. Ztg.*, Nov. 20, 1878, p. 800.

Presence of Furfurol in Commercial Glacial Acetic Acid.—Victor Meyer stated some time ago that apparently excellent commercial so-called 99 to 100 per cent. glacial acetic acid, when brought into contact with anilin, caused a beautiful red coloration which did not appear any more after the acid had been distilled over chromic acid; he now reports that comparative colorimetric experiments have fully convinced him that the color reaction is due to the presence of about 0·108 g.

of furfurol in a liter of the glacial acetic acid.—*Ber. d. Deutch. Chem. Ges.*, 1878, p. 1870.

Phenolphthalein[1] Indifferent to Bicarbonates.—Experiments with phenolphthalein, the use of which is recommended when saturating alkaline carbonates with acid, convinced Vielhaber that alkaline bicarbonates have not the least effect upon it.—*Arch. d. Pharm.*, Nov., 1878, p. 410.

Delicacy of Several Tests for Hydrocyanic Acid.—A. Link and R. Moeckel made a series of experiments in order to investigate the delicacy of different tests for hydrocyanic acid with the following results:

1. *The silver test* (precipitation of cyanide of silver).—On the addition of a solution of silver to an acidulated concentrated solution of hydrocyanic acid, a precipitate is immediately formed; but if the liquid is much diluted it is necessary to add an excess of ammonia before the silver solution is added, and to acidulate afterwards with nitric acid. No reaction takes place if the hydrocyanic acid is diluted in the proportion of 1:250,000.

2. *Ferrocyanide of Iron Test.*—The precipitation of ferrocyanide of iron in a solution of hydrocyanic acid, to which one drop of a moderately concentrated solution of sulphate of iron containing ferric salt, and sufficient diluted solution of potassa to yield an alkaline reaction, had been added, begins to be doubtful in a dilution of 1:50,000.

3. *Sulphocyanate of Iron Test.*—This is the most delicate test. After the addition of 1 drop of a dilute solution of soda-lye to the hydrocyanic acid solution, sulphydrate of ammonium is added, the mixture evaporated to dryness, and to the residue a few drops of hydrochloric acid and of ferric chloride are added. The resulting blood-red color can be noticed in a dilution of 1:4,000,000, although it has then an orange tint.

4. *Guaiacum-Copper Test.*—Strips of white filtering-paper are dipped into a 4 per cent. solution of resin of guaiacum and moistened with a drop of a ¼ per cent. solution of sulphate of copper. The characteristic blue reaction resulting when brought into contact with the hydrocyanic acid solution takes place, when diluted in the proportion of 1:3,000,000.

[1] See paper by C. W. Drew in "Amer. Jour. Pharm.," 1878, p. 513.

5. *Iodide of starch solution* will only yield a reaction with concentrated solutions.—*Ztschr. f. Analyt. Chem.*, 1878, p. 455.

Determination of Hydrocyanic Acid in Bitter Almond Water.—H. C. Vielhaber uses Pappenheim's or Baedecker's process, which consists in rendering a convenient bulk of the water slightly alkaline, by magnesium hydrate suspended in water, adding several drops of solution or potassium chromate and then carefully solution of nitrate of silver (1:10), until the red coloration, indicating the union of chromic acid and oxide of silver, no longer disappears. The exact quantity of silver necessary for precipitation can thus be observed and the hydrocyanic acid be determined accurately.—*Archiv. d. Pharm.*, Nov., 1878, p. 408.

DETECTION AND APPROXIMATE DETERMINATION OF MINUTE QUANTITIES OF ALCOHOL.[1]

By J. C. Thresh, Pharmaceutical Chemist.

That the detection of small proportions of alcohol is a matter of some importance is evident to any one who looks through the Year-Books issued by our Conference, no less than sixteen papers bearing on the problem being abstracted in the volumes already published. The analyst desires a test which will enable him to detect with absolute certainty the presence of alcohol in essential oils and other medicaments when mixed therewith, and the physiologist requires such a test to solve a number of problems relating to the action of alcohol upon the system and its presence or absence in the tissues and animal fluids. Hitherto no process has been published which is capable of giving certain results in such cases, either qualitative or quantitative.

Probably the best test as yet proposed is that of Lieben as modified by Hager (abs. Y. B. P., 1871, 237), which depends upon the formation and deposition of crystals of iodoform, when solutions of iodine and potassium hydrate are added successively to the warmed fluid containing alcohol. This test is said to be capable of detecting 1 part in 2000 of water, but I have failed to obtain by it any decided reaction with so dilute a solution. Moreover, a number of other volatile and non-volatile compounds yield the same reaction under similar circum-

[1] Read at an Evening Meeting of the Pharmaceutical Society of Great Britain, Nov. 6, 1878.

stances (*e.g.* aldehyd, acetone, methyl alcohol, propyl alcohol, volatile oils, gum, sugar, lactic acid, etc.). Another general test is Hardy's (abs. Y. B. P., 1872, 161), depending upon the production of a blue color when guaiacum resin, hydrocyanic acid and sulphate of copper are added to an aqueous solution of alcohol, but it is incapable of detecting less than 1 part in 150. In the same Year-Book (page 160) is an abstract of a method proposed by M. Berthelot. Benzoic chloride is mixed with the suspected solution, the mixture warmed, and a little caustic potash added, when a characteristic odor of benzoic ether is evolved if alcohol be present. This test is very sensitive with a 4 or 5 per cent. aqueous solution, but when smaller proportions are present, or the fluid contains other odorous substances, it is quite useless.

The old chromic acid test as hitherto applied is perhaps the most fallible of all, since innumerable substances give the same reaction, in virtue of their greed for oxygen. A more modern test is that proposed by Davy (abs. Y. B. P., 1877, 109), and depends upon the production of a blue coloration when molybdic acid dissolved in sulphuric acid is added to the fluid containing alcohol, but Hager (abs. Y. B. P., 1877, 285) failed entirely to obtain the reaction. Besides these general tests a great many others have been proposed for use in special cases; thus Boettger (abs. Y. B. P., 1873, 164) recommends solid caustic potash for detecting alcohol in ether, and anhydrous glycerin for its detection in essential oils. Fuchsin, tannin, anilin red, jalap resin and many other substances have also been similarly employed, but scarcely one of the tests enumerated, it is worthy of mark, is capable of being employed to make even an approximate quantitative determination of the ethyl hydrate.

Some time ago, when examining a solution containing aldehyd, I was struck by the remarkable delicacy of the caustic potash reaction; I found that an aqueous solution containing one one-thousandth part of pure aldehyd, when boiled with a fragment of solid caustic soda or potash and allowed to stand for a little while, exhibited a distinct yellow color. If a solution containing ·5 per cent. of aldehyd be thus treated, the liquid becomes deep yellow, and a flocculent yellow precipitate gradually subsides, and this solution when diluted first with a little alcohol and then with 50 volumes of water still exhibits a yellow tint

when examined in a long test tube over a sheet of white paper or a porcelain slab.

I then commenced a series of experiments, having for their object the detection of minute quantities of alcohol by converting it into aldehyd, and treating the resulting solution with caustic alkali. After making a great number of attempts I succeeded in devising a method which is not only reliable as indicating with certainty the presence of alcohol, but which within certain limits gives fairly approximate quantitative results.

Distillation with sulphuric acid and permanganate of potash was first tried and it was found that with a given proportion of permanganate a ·1 per cent. solution of alcohol could readily be detected, but with even a slight excess of permanganate the results were entirely negative. Other oxidizing agents were then tried, and bichromate of potash found to be the most reliable, since an excess, unless large, did not materially decrease the yield of aldehyd. Still the quantitative results obtained from the same solution varied very considerably, and for some time the cause was apparently inexplicable. At length, noticing that when the determinations were very low considerable bumping took place during the distillation, several substances were added to obviate this, and it was found that when a few small pieces of pumice were placed in the flask the distillation proceeded evenly and the results were remarkably uniform. Fresh pumice must be used for each distillation. For an aqueous solution containing from ·04 to ·4 per cent. of alcohol the following method may be relied upon for quantitative determinations, whilst it will detect with certainty ·01 per cent., or 1 in 10,000. When the quantity of alcohol present differs much from the proportion here given the determination is too low, becoming more and more unreliable as the percentage rises above or falls below these limits.

The requisites are a saturated solution of bichromate of potash, a dilute sulphuric acid (B. P. acid and water, equal quantities), a syrupy solution of caustic soda, methylated spirit free from aldehyd, a 200 cc. flask with good condensing arrangement attached, and a long narrow test tube graduated to 3 and 23 cc.

One hundred cc. of the dilute alcohol are placed in the flask, 2 cc. of bichromate solution, 8 cc. of the dilute acid, and a few pieces of pumice are added and 20 cc. distilled (not too rapidly), and the distillate conveyed by a long tube to the bottom of the test tube in which has been

previously placed 3 cc. of the soda solution. The liquid in the tube is then heated, kept at the boiling point for a few seconds and placed aside for a couple of hours. If ·1 per cent. of alcohol was contained in the original solution the contents of the test tube will be of a deep yellow color, and will have deposited flocks of aldehyd resin; with ·05 per cent. no resin is formed, but the fluid is deep yellow and perceptible opalescent; with ·01 per cent. the color is just perceptible, but the characteristic odor is still very distinct. To make a more accurate determination dilute 1 part of pure aldehyd with 200 of water, to this add 30 parts of the caustic soda solution and treat in the same way as the above distillate. After the lapse of two hours (the reaction not being complete for nearly this length of time) dilute with 200 parts of warm methylated spirit and add water to 500 parts. This solution is quite clear and of a reddish-yellow color and will keep for some time, especially if not exposed to the light. Mix 5 cc. of this solution with 45 cc. of water in a glass such as is employed for nesslerizing, and take this as a standard solution. It does not keep more than two or three hours, hence fresh standards must be from time to time prepared, or a solution of bichromate of potash made of equal depth of color (the tint being almost identical) and kept as a standard of reference. To make the quantitative determination, dilute the distillate with sufficient warm spirit to make a clear solu tion and add water to 50 cc. Upon ascertaining the quantity of thi solution, which must be diluted with water to 50 cc. to bring the depth of color to that of the standard solution, the percentage of alcohol in the original solution is immediately known. The following are fair specimens of the results obtained:

Strength of Alcoholic Solution.	Strength calculated from result of experiments.
·02 per cent.	·012
.1 "	·089
·1 "	·1
·1 "	·088
.1 "	·092
·2 "	·166
·2 "	·208
·05 "	·039
·2 "	·170
·4 " (3 cc. $K_2Cr_2O_7$ Sol.)	.308

Having ascertained the reliability of the method, where the alcohol

was diluted with water only, the effect of the presence of other substances was tried. Städeler has shown that albumin, fibrin, gelatin, and lactic acid, yield a trace of aldehyd when treated with sulphuric acid and bichromate of potash, or peroxide of magnesia, hence these compounds must be removed from solution before the test is applied. No substances, with these exceptions, besides the ethyl compounds are known to yield aldehyd when thus treated. Various essential oils, chloroform, amyl alcohol, etc., were shaken with water and the solution distilled with these oxidizing agents, but no yellow color was produced. The distillate from clove water was pink, but when ·1 per cent. of alcohol was added the pink tint was quite overpowered by the yellow color of the aldehyd resin produced. Ether of course yields aldehyd when oxidized, hence this test will not serve to detect alcohol in ether. To detect alcohol in essential oils and chloroform, agitate the sample with an equal quantity of water, and when the aqueous solution has become clear, remove with a pipette and distil with the bichromate and acid. ·5 per cent. is thus easily detected. The subjoined table gives the results of several quantitative experiments. Four cc. of the substance examined were shaken vigorously with 8 cc. of the dilute acid and 92 cc. of water, and when clear 50 cc. of the acid liquid placed in a flask and distilled with a sufficient quantity of bichromate. Ten cc. of distillate are collected in a tube containing 2 cc. of soda solution and boiled, diluted and nesslerized.

Name, etc.	Quantity of Bichromate Solution added.	Result.
Oil of Lemons,	2 cc.	none.
" " with 5 p. c. alcohol,	2 "	3·6 p. c.
" Rosemary, with 5 p. c. alcohol,	2 "	3·9 "
" Bergamotte,	2 "	none.
" " with 10 cc. alcohol,	2 "	9·7 p. c.
" Lavender, English,	3½ "	none.
" " Foreign,	3½ "	3·6 p. c.
" " " with 2½ p. c. alcohol,	3½ "	6·3 "
" " " washed,	3½ "	none.
A Pure Chloroform,	2 "	a trace.
" " with 5 p. c. alcohol,	2 "	4·2 p. c.
" " with 1 " "	2 "	·92 "

The oil of lavender (exot.) was undoubtedly adulterated, since after being washed with water, and examined, no reaction was obtained.

Deducting 3·6 from 6·3, we have 2·7 as the percentage of alcohol added.

Alcohol is said not to suffer decomposition in presence of pure water. To confirm this, a sample of well boiled water had ·1 per cent. of alcohol added, and determinations made daily. After ten days the quantity of alcohol was found undiminished. An impure tank water, to which ·1 per cent. of alcohol had been added, did not contain a trace twenty-four hours afterwards. The presence of decaying organic matter of all kinds has this effect, and no doubt this reaction is in some degree a measure of the quality of awater.

Rajewsky (Pflüger's "Archiv," xi., 122, "Abs. Y. B. P.," 1876, 125) when investigating the action of alcohol upon the system, its passage into the brain and muscle, and the length of time which it remains there, came to the conclusion that the iodoform test is either not applicable to the detection of alcohol in the tissues or that alcohol is a normal constituent of brain and muscle. I have applied the aldehyd test to a number of infusions of fresh muscle, or rather to the distillate from this infusion, but have failed to detect the slightest trace of alcohol.

The chromic acid reaction is still often quoted as a test for alcohol in the urine, but as shown by Chaumont (abs. Y. B. P., 1885, 147) the test is not to be relied upon even when applied to the distillate. A number of experiments were tried with various samples of urine, with and without the addition of alcohol. By adding a sufficient quantity of bichromate to oxidize all the oxidizable matter present in the urine good quantitative results were obtained. By distilling the urine and estimating the alcohol in the distillate, the results were all much too low, but when about a gram of ferrous sulphate was added to the urine previous to distillation, the results were much more approximate. Should the urine contain albumen it must be distilled and the distillate examined, but otherwise equally good results are obtained without distillation. After partaking of an alcoholic fluid, distinct traces of alcohol are found in the urine two hours afterwards. The quantity (after taking 12 cc. of absolute alcohol) in the urine two hours after was about ·02 per cent., and about the same proportion was found ten hours afterwards, and traces were present for upwards of twenty-four hours. Forty hours after no alcohol could be detected. From the quantity of urine excreted, the results of two determinations went to

show that not more than ·7 per cent. of the alcohol taken passes in the urine unchanged.

By concentrating fluids supposed to contain alcohol by one or more distillations, exceedingly minute traces can be detected by this process, especially if only one-tenth instead of one-fifth be distilled.—*Pharm. Jour. and Trans.*, Nov., 1878.

PRELIMINARY NOTE ON ACETO-NITRATE OF IRON AS A MEDICINAL AGENT.[1]

By John Williams.

Some few years back, M. Scheurer-Kestner ("Ann. Chim. et Physique," third series, vol. lxiii, p. 422, and Watts' "Chemistry," first suppl., p. 11) pointed out the existence of a series of salts, formed by the combination of peracetate and pernitrate of iron. The description given of these salts is not very clear or definite, and would lead one to suppose that the compounds formed by the union of these two salts of iron were so readily decomposable as to preclude any hope of utilizing them for commercial or therapeutic purposes. Still these salts, if they could be readily prepared, promised to be of such service that it was determined to make some experiments to settle that question, and I am indebted to my friend Mr. Miles Smith for suggesting and undertaking the work of preparing these salts and investigating the nature of the products obtained.

Various processes are mentioned by Mr. Kestner for producing these salts. The addition of a strong solution of acetate of iron to one of nitrate, the addition of nitric acid to solution of acetate, or of acetic acid to a solution of the nitrate, or the solution of hydrated ferric oxide in a mixture of the two acids, and one or two other processes are named, and, according to the author, yield salts of varying constitution, and named by him respectively mono-, di-, tri- and tetraceto dinitrate of iron. He, however, mentions that the tetraceto salt, having the composition $Fe_2\begin{cases}(C_2H_3O)_4\\NO_3\\HO\end{cases}+4$ aq., crystallizes in hard, shining, red-brown rhombic prisms, and is less deliquescent than the other acetonitrates.

[1] Read at the Evening Meeting of the Pharmaceutical Society of Great Britain, Dec. 4, 1878.

Now, in the course of the experiments I am about to describe various salts, having different tints of color, some being nearly black and having various degress of deliquescence, have doubtless been obtained, and may very probably be the salts having the various composition attributed to them by Mr. Kestner, and I must admit that no attempt to analyze them has as yet been made by me. But, upon recrystallization, the various salts all appeared to yield one and the same salt as the final product, and this leads me to suspect that the various salts named may in reality be one in a more or less impure condition. Of course, I should be very sorry to express a positive opinion upon this matter without making many more experiments and analyses, and it is proper I should mention that the experiments we have in hand are at present in a very unfinished state. Still, I am bound to repeat that, as far as I can judge with my present knowledge, we appear always to obtain one definite salt by the recrystallization of any of the others.

Perhaps the best mode of forming the acetonitrate of iron is to dissolve hydrated ferric oxide, which must be quite recent and well washed, in a mixture of glacial acetic and nitric acids, in which the acetic acid is in considerable excess (say two or three parts to one); the hydrated oxide contains sufficient water to dilute the solution, and the oxide must be added slowly so as to avoid very great elevation of temperature. The solution so formed in 24 hours deposits a quantity of the double salt, in hard, well-formed crystals. These, drained from the mother-liquor can be dissolved in a small quantity of warm (not boiling) water, strained if necessary, and allowed to crystallize. The crystals so deposited have all the characters assigned to the tetracetodinitrate of iron, and I assume may be fairly taken as being represented by the formula given for that compound.

I find these crystals are not by any means so easily decomposed as the original description would lead one to infer; on the contrary, they are quite permanent, and so slightly deliquescent that they can readily be kept in paper for several days without spoiling.

They are very soluble in water, in the cold or gently warmed, but I find the solution of the salt is decomposed by boiling, basic compounds being deposited which cannot afterwards be got into solution. It is also freely soluble in alcohol, but practically insoluble in ether.

The various solutions of this salt have a pure styptic taste, quite free

from acidity, and not by any means as disagreeable as the tincture of the perchloride.

Unfortunately, a difficulty attends the keeping of solutions of this salt, which, up to the present time, I have not succeeded in overcoming. Both the aqueous and alcoholic solutions are liable to gelatinize after being kept a few days or weeks. Tinctures made with absolute alcohol, rectified spirit and proof spirit equally pectized after a time. I thought a tincture made with equal parts of rectified spirit and water was successful, but it went at last very suddenly and apparently without cause, it having been liquid in the morning and a jelly in the afternoon. I am still trying the effects of spirit of various strengths, in hope of obtaining a solution which will prove permanent. The addition of free acetic acid, I may mention, has also been tried, but did not prove effectual.

At the suggestion of Mr. Holmes, I have lately made a solution in dilute glycerin: 1 oz. of glycerin, 3 ozs. of water and 2 drachms of nitro-acetate. The solution is perfect, and up to the present time has kept well, and I think promises to be a success, but what effect the glycerin might have upon the medicinal properties of the salt I am unprepared to state. I should add that the tinctures I have been experimenting upon were all made of the strength of 1 oz. troy of the crystallized salt to the pint (imperial). This, I calculated, would about represent the strength of the tinct. ferri acetatis of the Pharmacopœia.

There is no doubt, I think, that this curious compound, the nitro acetate of iron, imperfect as it may be in some respects, may probably be used with advantage in medicine. There has been a want, long felt, of a definite, crystallized, non-deliquescent per-salt of iron, and the present salt could be administered in the form of pills with facility, and also in mixtures when the medicine is not intended to be kept long, but taken within a few days of being dispensed. There is also probably an advantage in the fact of the salt containing a large proportion of an organic acid and only a small quantity of a mineral one, and we should be able to get over the difficulty of keeping a solution suited for dispensing purposes, I think the compound would prove of very considerable use as a medicinal agent.

Although the experiments I have described may be considered to have resulted in failure as far as a very essential point is concerned, still I trust the subject will prove to have sufficient interest to excuse my bringing the matter before the Society in its present incomplete form. —*Pharm. Journ. and Trans.*, Dec. 7, 1878.

LINIMENTUM TEREBINTHINÆ ACETICUM.

By W. Symons, F.C.S.

In a short paper read at the Bristol meeting of the Pharmaceutical Conference in 1875,[1] I suggested an improved method of preparing the above liniment, which attracted more attention than I anticipated. The object of the paper was not so much to give an exact formula in the place of that in the Pharmacopœia as to point out a way in which a perfectly clear and stable liniment may be prepared, instead of the very unsatisfactory one in the Pharmacopœia.

Having been desired to suggest a formula as near the Pharmacopœia liniment as possible for dispensing, my attention has again been called to the subject. The first proposed formula in my paper was—

No. 1.

Glacial Acetic Acid,	1 part.
Spirit of Camphor,	2 parts.
Castor Oil,	1 part.
Turpentine,	2 parts.

Mixed in the above order.

The second was—

No. 2.

Liniment of Camphor,	2 parts.
Castor Oil,	2 "
Turpentine,	2 "
Glacial Acetic Acid,	1 part.

The castor oil, however, in this formula is unnecessary, and a clear and stable liniment may be made as follows:

No. 3.

Turpentine,	3 parts.
Liniment of Camphor,	3 "
Glacial Acetic Acid,	1 part.

This may be said to be identical with the Pharmacopœia liniment, minus 2 parts of water, for as, according to the Pharmacopœia, glacial acetic acid contains 84 per cent. of anhydrous acetic acid, while the B. P. acetic acid contains 28 per cent., it is assumed to be near enough to the truth for the purpose of this paper to speak of B. P. acetic acid as containing one part glacial acid and 2 parts water. The Pharmacopœia liniment will thus contain 1 part in 9 of glacial acid, while No. 3 will contain 1 part in 7, although the proportion of glacial acid to the turpentine and camphor will be identical in each.

Should it be thought desirable to have in the liniment exactly the

[1] See "Amer. Jour. Phar.," 1875, p. 540. The "turpentine" in the formulas is intended for "oil of turpentine."—Ed. A. J. Ph.

same proportion of acetic acid as in the Pharmacopœia, *i.e.*, in relation to the whole quantity of liniment, the formula would be—

No. 4.

Turpentine,	4 parts.
Liniment of Camphor,	4 "
Glacial Acetic Acid,	1 part.

Should spirit be considered a desirable ingredient of the liniment, of course No. 1 may be adopted, but it will be perceived that the proportion of glacial acid in this formula is 1 in 6. If this be thought too much, the following may be a satisfactory formula:

No. 5.

Glacial Acetic Acid,	1 part.
Spirit of Camphor,	3 parts.
Castor Oil,	2 "
Turpentine,	2 "

Mixed in the above order.

Of course it is a medical rather than a pharmaceutical question as to which of the above formulæ may be the best, but as it has been stated to me that it is not desirable to increase the proportion of acetic acid, I should say that No. 4 is the preferable one.

It may be well to say that the above liniments were made with glacial acetic acid from a respectable London house, labelled "solid at 50°," but which has actually crystallized at 52°, and the crystals have not completely dissolved in a day in a temperature of 58° to 62°, so that it is stronger than the Pharmacopœia acid, which "crystallizes when cooled to 34°, and remains crystalline until the temperature rises to above 48°." On mixing only 5 per cent. of acetic acid, B. P., with the above acid, none of the above formulæ gave satisfactory results.

Probably it may be said that no simpler or more quickly applied test of the strength of glacial acetic acid has hitherto been suggested than the making of this liniment. With regard to the point of crystallization, and as an illustration of the apparent anomalies so fully discussed by Mr. Tomlinson in his paper on "Supersaturation," I have had the same glacial acetic acid in a similar bottle, exposed during a night to a temperature of 49° without crystallizing: but on dropping in a crystal it was at once converted into a solid mass.

Has not this subject also some bearing on the discussion as to the solubility of Magnesium sulphate as contrary to Mr. Brown's experience? I do not find Howard's magnesium sulphate even remain in solution in its own weight of distilled water at 60°.—*Pharm. Jour. and Trans.*, Dec. 21, 1878.

THE GREAT GEYSERS OF CALIFORNIA.[1]

By Richard V. Mattison, Ph.G.

Of all the wonders nature has so bountifully lavished on the Golden State, there is not one so interesting to an Eastern druggist or chemist as the great geyser region. There is something even terrifying in its indescribable grandeur in the Valley of the Yosemite, a feeling of awe overcoming us as we gaze far above us at the verdant domes of the gigantic *Sequoias*, nor does the kelp-fringed shores of the Pacific lack appreciation; but all lack the soul-absorbing interest one takes in the chemical refuse of the Pluton canon. We reach it by stage from Cloverdale, winding sixteen miles along through the canon, crossing and re-crossing the *Arroyo Piscaro*, which the '49ers, or some more modern ranchmen, have rather freely translated to "Pluton Creek." Passing through the canon—one of the most beautiful we have ever seen—we reach, after a few hours' ride, the junction with Geyser canon, which is situated in a spot of rare loveliness. Upon either side are mountains shutting off the view in any direction, while at our feet rushes the rapid stream so famous for its speckled beauties. As we cross the rustic bridge of logs and gain entrance to the Geyser trail, there flashes over us the thought that we have been there in years gone by. Yes, it is the same familiar odor with which we long ago became acquainted, while a student in the laboratory of the College of Pharmacy, the fumes of hydrogen sulphide, sulphurous acid, etc, make a combination which to become once acquainted with is to always remember. The earth beneath us is white, as if we were treading the vicinity of an ancient lime kiln, and as we pass up the canon amidst the rumbling and roaring of the escaping steam, we fancy ourselves either treading the refuse of a large chemical laboratory or surrounded by the many-colored productions of a paint and color mill; and such, in truth, it is, or rather was, for a legend still remains that, as the gallant brave resorted here to procure his war paint, so the coy maiden of the Digger tribe came also to touch her dusky cheeks with the rouge of nature's manufacture. On either hand, the banks stretch away up the mountain side and we place a hand on the hot vermillion, which tints the face of the serpentine cliff whose cheeks are now too pale from the magnesium salts so abundantly strewn around. In front of us is a grotto lined with the long, silky, asbestos-like needles of magnesium sulphate, the floor is carpeted with the ferrous salts, the green tint of which is relieved by the yellow and brown of the ferric compounds and the cerulean of the copper salts. Alum crystals are on every hand, and as we touch our lips to the waters of the boiling stream at our feet, we think the taste as familiar as was the odor upon our first entrance; it is that of ammonio-ferric alum, though here the salt is a magnesio-ferric one. The rock formation of the whole region is a mixture of stratified and igneous varieties, the cinnabar occurs here, as it does usually, in veins among the serpentine; iron and copper, as usual, exist with it and, as the whole undergoes decomposition, the imagination must picture the various tints. A few paces in front is a circular basin about twelve feet in diameter, where the water boils unceasingly year after year. It is called the Witch's Cauldron, and we cooked eggs in it after three minutes exposure; just beyond, the steam issues forth in a stream of some six inches diameter with the regular puff! puff!! puff!!! of an exhaust pipe from an ordinary

[1] Read at the Alumni Meeting, January 2d.

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engine. Some idea of the strength of this discharge may be had from the fact that a stout Alp-stick, weighing six pounds, was repeatedly raised from eight to twelve inches by the violence of the puff and thrown to one side, while a handkerchief was carried fully ten feet by the violence of the discharge. Under our feet, and upon every side, are numerous apertures called "blow-holes," from which the steam issues with varying force. Most of these blow-holes are lined with the most perfect crystals of the purest sulphur in needle-shaped, oblique, rhombic prisms; steam issues from every side, and, in the early morning, in many places it is scarcely possible to obtain secure footing upon the slippery rocks, so enveloped are we in clouds of steam, while the heat is intense and the ground rumbles beneath our feet, reminding us of the stamp mills of the quartz mining districts. The quartz veins here remain intact, the magnesium silicate being dissolved and the mercuric sulphide disintegrated, leaving the rock of peculiar honeycombed appearance, and by the side of the boiling stream at our feet mingles another stream of the coldest water. To our right, as we pass along, we find the fountain of "eye-water," which is of a slight astringent character, while further on a basin of ink, so called, is discovered, consisting of a finely disseminated mixture of mercurous sulphide with the acidulated water. The water passing through the canon is so distinctly acid as to instantly remove the color from the clothes where it splashes upon them; these spots afterwards easily develop into holes upon very slight inducement after drying. Upon either side of the canon, rising one after another, are brilliant crusts of alum tinged with ferrous and cupric salts, and the rocky basins along the sides of the stream are full to overflowing with boiling, seething, villainous chemical concoctions, their sides decked with various crystal efflorescences. Sulphur, here, is in his element; the whole family is represented, of almost every ending and color. A few miles below, we have the remains of an extinct geyser, now the Pluton Sulphur Mines, while at Sulphur Banks is another, and a few miles above still in Pluton Canon, there is another small geyser, the steam from which, in the cool, brisk air of the early morning, can be seen for miles. When they become extinct, the remaining debris is profitably worked for both sulphur and mercury. The cause of the violent ebullition is chemical action intensified by the action of water. The ground-work of the geyser patches is an easily decomposed serpentine, holding with it mercuric, ferrous and cupric-sulphides. We believe the heat is generated by their decomposition and not from any volcanic action, as seems the universal belief of the dwellers in and around the region. Crossing Temperance Creek, which seems a misnomer to the traveler in California, so almost universal is intemperance, we come upon what is perhaps the greatest wonder of all. We find here a large blow-hole, two or three hundred yards from the canon, and seemingly not connected with it, from which the steam rushes forth with astonishing violence. A bucket of water thrown into it is ejected with a roar, and stones, several ounces in weight, are projected a distance of several feet. At one time a steam whistle was sunk into this blow-hole and was heard night and day for a distance of many miles, but it was impossible for guests at the hotel, half a mile or more distant, to sleep, so it was voted a nuisance and finally removed. Pages might be spent in describing the steam baths and hot springs of the Pluton Canon, but if we have been able to

interest our pharmacal friends in this wonderful region of natural curiosities situated amid the most delightful scenery and with the best hunting and fishing we have ever enjoyed, and within a short distance of the Petrified Forest, where trees of stone a dozen feet in diameter can be seen, we will be abundantly satisfied, while if the interest is such as to project a visit in person, verily great will be their reward!

Philadelphia, 12th mo. 30th, 1878.

AMOUNTS OF SUGAR CONTAINED IN THE NECTAR OF VARIOUS FLOWERS.

By A. S. Wilson.

The sweet-tasted fluid which is secreted within the cups of insect-fertilized flowers is called nectar, and the object gained to the plant by its presence is that insects, induced to visit flowers for its sake, are useful to the plants by effecting a cross-fertilization. In many instances this sweet liquid is exuded from special glands, but in other cases from portions of the flower which do not seem to have been specially adapted for this purpose. It is a point in dispute amongst biologists whether this saccharine matter is a true secretion, or simply an excretion of effete matter from the vegetable cells—a bye-product of the chemical changes taking place within the cells. The latter view seems to be favored by the fact that a similar sweet-tasted fluid, much sought after by insects, is exuded on different parts of some plants quite unconnected with the flower, as in the laurel, brake, fern, lime tree, acacia, etc. The bright colors, as shown by Lubbock's experiments, serve to guide insects to the flowers, and the odors which they emit fulfill the same end. The importance of these guides to insects will be apparent from the following estimations, which show how indispensable it is that as little time as possible should be lost by an insect collecting honey. The formation of nectar is observed to take place most freely in hot weather, and to be prevented by cold or wet. By biologists, the visits of bees, butterflies and other insects are believed to have exercised in past time an important influence in modifying the size, shape, color, etc, of flowerss and the following experiments are of interest as showing to what an extent this action takes place in nature, and as helping to determine the value of this factor. The nectar was extracted with water, and the sugar determined, before and after inversion, by means of Fehling's copper solution. In the case of fuchsia—which is not deprived of its nectar by any insect in this country, the nectar being inaccessible to native species—we have probably the whole amount formed, but in other cases the visits of bees, etc., may have reduced the amounts considerably. In this case it is a clear colorless liquid, having an acid reaction and an intensely sweet taste; that of many others has the strong characteristic odor of honey.

Sugar in Flowers.

	Total mgram.	Fruit sugar.	Cane sugar? (as fruit).
1. Fuchsia per flower,	7·59	1·69	5·9
2. *Claytonia Alsinoides*, ditto,	0·413	0·175	0·238
3. Everlasting pea, ditto,	9·93	8·83	1·60
4. Vetch (*Vicia Cracca*) per raceme,	3·16	3·15	0·01
5. Ditto, per single flower,	0·158	0·158	—
6. Red clover, per head,	7·93	5·95	1·98
7. Ditto per floret,	0·132	0·099	0·033
8. Monkshood, per flower,	6·41	4 63	1·78

Approximately, then, 100 heads of clover yield 0·8 gram sugar, or 125 give 1 gram, or 125,060 1 kilo of sugar; and as each head contains about 60 florets, 7,500,000 distinct flower tubes must be sucked in order to obtain 1 kilo. of sugar. Now as honey, roughly, may be said to contain 75 per cent. of sugar, we have 1 kilo equivalent to 5,600,000 flowers in round numbers, or say 2½ millions of visits for one pound of honey. This shows what an amazing amount of labor the bees must perform. Another point worth notice in these results is the occurrence of what appears to be cane-sugar, and in the case of fuchsia in the proportion of nearly three-fourths of the whole. This is remarkable, as honey is usually supposed to contain no cane sugar, the presence of the latter being usually regarded as certain evidence of adulteration. The question therefore arises whether this change, which takes place while the sugar is in the possession of the bee, is due to the action of juices with which it comes in contact while in the honey-bag or expanded œsophagus of the insect, or whether the process of inversion goes on spontaneously, as may perhaps be the case.—*Jour. Chem. Soc*, Dec., 1878, from *Chem. News*, xxxviii, p. 93.

RESEARCHES ON PEPTONES.

By A. Henninger.

Peptones, the ultimate products of peptic digestion, have hitherto been found difficult to obtain in a state of purity, owing to their tendency to retain mineral salts or bases, and have yielded on incineration from 3 to 7 per cent. of ash. Maly obtained a fibrin-peptone, which yielded only 0·64 per cent. of ash, by separating the mineral substances by diffusion. The author proposed to attain the same end, by starting with albuminoids free from mineral matter, and using subsequently only such reagents as could be completely removed by precipitation. Substituting, therefore, sulphuric for hydrochloric acid, he found the process required two or three times as long for completion, but the acid could then be exactly removed by baryta.

The pepsin used was of three kinds—an aqueous solution dialyzed from a dog's gastric juice, a glycerin solution obtained by Wittich's method, and a very active commercial pepsin. The albuminoid matters were free from mineral matter, as detailed below.

Fibrin.—The substance, after having been soaked in water containing 1 per cent. of hydrochloric acid, was tied up in a cloth, gently expressed and hung in distilled water, which was constantly changed; the mass in the cloth was frequently kneaded and squeezed, and all the acid and the salts rendered soluble by the acid were thus removed in the course of three or four days. The gelatinous mass was then thrown into absolute alcohol, which was changed several times. The fibrin, after a final prolonged treatment with ether, to remove fatty matters, did not yield more than 0·29 per cent. of ash.

Albumin, purified by dialysis, yielded only 0·48 per cent. of mineral matter.

Casein.—Skimmed milk was mixed with 1-200 of soda solution and freed from fat by four successive treatments with ether; the product was then partially neutralized with dilute phosphoric acid and mixed with a little hydrocyanic acid to hinder putrefaction. This liquid was subjected to dialysis for twelve days, changing the

water twice a day; the casein was then separated by adding acetic acid and boiling, and was washed with water.

The purified albuminoid matter is heated at 44°, with five times its weight of water containing 3-1000 of H_2SO_4, and the quantity of pepsin requisite to secure rapid digestion. After three or four days the liquid is filtered, freed from all its sulphuric acid by baryta and evaporated at 60° to 70°. Alcohol is gradually added to the syrupy residue until the liqnid becomes turbid and separates, on standing, into two layers; the lower consists of a little impure peptone, and contains the greater part of the coloring matters. The upper layer is poured in a fine stream into six times its volume of 98 per cent. alcohol, which is meanwhile vigorously stirred; the peptone which settles down is dissolved in a little water and precipitated by alcohol, and this process is repeated The peptone is then treated with absolute alcohol, first cold and then warm, and finally several times with ether. These treatments with alcohol and ether render insoluble a small quantity of albuminoids, which remain as a residue on re-dissolving in water; one more precipitation with alcohol yields a peptone perfectly soluble in water. A trace of impurity, detected by a slight turbidity being produced with acetic acid and potassium ferrocyanide, can be entirely removed by dialysis, continued for about ten days. A small quantity of perfectly pure peptone was thus obtained.

The peptones prepared from fibrin, albumin and casein are amorphous, infusible, white powders, very soluble in water and in glacial acetic acid. They behave like feeble amidated acids. In an acetic solution of the peptones sulphuric, hydrochloric or nitric acid produces at once an abundant white precipitate, consisting of a salt of the peptone, corresponding to the acid used. The different peptones show no difference in their reactions; they differ from albuminoids in being less easily coagulated and precipitated; they very nearly resemble gelatin, but their hot solutions do not set on cooling. The peptones prepared from albumin, fibrin and casein show different rotatory powers, that from albumin causing least, and that from casein most rotation. So long, therefore, as the albuminoids which differ in their rotatory power are allowed to be different varieties, we must also admit the existence of varieties of peptones.—*Journ. Chem. Soc*, Dec., 1878, from *Compt. Rend.*, lxxxvi, p. 1413-1416.

VARIETIES.

Honey, recently sent to England in the comb for the first time, reached Liverpool safely on Dec. 5th, and the experiment is pronounced successful. There were eighty tons in one ship, stored—says the "Pall Mall Gazette," with some curiosity—"by American bees themselves into half a million neat little glass side boxes." That the honey was the partial product of 12,000 swarms of bees, in which a large mercantile firm is interested, and which are distributed throughout the honey-producing sections of the United States in apiaries of 100 swarms each. "There seems to be no limit," it says, "to the provisions with which America is prepared to supply us.

The first experiment of bringing honey in the comb on a large scale to Europe from America having proved successful, it will, no doubt, be repeated. Honey will even perhaps become with us as it was with the ancients, an important article of food."

Cow's Milk. By Schreiner.—On boiling milk hydrogen sulphide is evolved, and can be easily detected in the usual way.

Boiled milk does not coagulate spontaneously so soon as unboiled milk; whilst, on the contrary, boiled milk requires 10 to 12 per cent. more acid to coagulate it than unboiled milk does. The amount of rennet which serves to curdle fresh milk is insufficient to curdle one-tenth the amount of boiled milk, even when applied ten times as long, and at the same temperature (35°C). The time required for spontaneous coagulation of fresh milk and the amount of acid required to produce the same effect, depend on the amount of solids in the milk. Unboiled milk treated with rennet curdles the sooner the less the amount of total solids. The amount of acid required to coagulate milk from the same animal increases in the time from the last calving up to the subsequent dry period, with the increase of the total solids during the lactation period. Milk from Friesland cows gave an increase of solids during this period of from 11 to 13 per cent., whilst that from Simmenthal cows gave an increase from 12 to 16 per cent. Crosses between the two breeds gave milk which sometimes approached the one and sometimes the other in the amount of increase.—*Journ. Chem. Soc.*, Dec., 1878, from *Landw. Versuchs-Stat.*, xxii, p. 60 to 64.

Cloth from Pine Apple Fibres.—At Singapore, in the East Indies, there is quite a thrifty branch of business in preparing the fibres of the pine-apple leaves for exportation to China, where they are manufactured into cloth. The process of extracting and bleaching the fibres is exceedingly simple. The first step is to remove the fleshy or succulent sides of the leaf. A Chinese, astride on a narrow stool, extends on it in front of him a pine-apple leaf, one end of which is kept firm, being packed beneath a small bundle of cloth on which he sits. He then, with a kind of two-handled plane of bamboo, removes the succulent matter. Another man receives the leaves as they are planed, and with his thumb nail loosens and gathers the fibres about the middle of the leaf, which enables him, by one effort, to detach the whole of them from the outer skin. The fibres are next steeped in water for some time, after which they are washed, in order to free them from the matter which still adheres and binds them together. They are now laid out to dry and bleach on rude frames of split bamboo. The process of steeping, washing and exposing to the sun is repeated for some days until the fibres are considered to be properly bleached. Without further preparation they are sent into town for exportation to China. Nearly all the islands near Singapore are more or less planted with pine apples, which, at a rough estimate, cover an extent of 2,000 acres.—*Public Ledger.*

Color-blindness.—M. Delbœuf, says "La France Médicale," has found that when a person afflicted with color-blindness looks through a layer of fuchsin in solution his infirmity disappears. M. Javal has made this discovery practical by interposing a thin layer of gelatin, tinted with fuchsine, between two glasses. The latter are said to correct the difficulty.—*Boston Med. and Surg. Journ.*

Nickel-plating of Iron or Steel Without a Galvanic Battery.—After adding to a dilute (5 to 10 per cent.) solution of pure chloride of zinc in a porcelain dish sufficient sulphate of nickel to produce a dark-green coloration and heating to the boiling point, Prof. Stolba immerses the metal, previously well cleaned, into this liquid, and boils for 30 to 60 minutes, when the metal is washed off with chalk-water and crefully dried, when it is covered with a durable but thin plating of nickel.—*Ztschr. d. Oest. Apoth.*, Oct. 10, 1878, from *Dingl. Polyt Jour.*

Electro-Deposition of Cobalt. By A Gaiffe.—Cobalt as deposited by the electric current is preferable to iron and nickel as a protective surface to clichés, &c., as it does not oxidize like iron, and when necessary it can be readily dissolved by dilute acids, which do not attack the copper under-surface. For the electro-deposition of cobalt on copper the author employed a neutral solution of the double sulphate of cobalt and ammonium. The positive electrode is connected with a platinum or preferably with a cobalt plate, and by passing a regular current through the solution for four hours an adhering and regular deposit of white metallic cobalt, 0.025 mm. in thickness, was obtained.

Becquerel claims to have already described a method similar to the above in a paper published in 1862.—*Jour. Chem. Soc.*, Dec., 1878, from *Compt. Rend.*

MINUTES OF THE PHARMACEUTICAL MEETING.

JANUARY 21st, 1879.

In the absence of the President, Mr. Alonzo Robbins was elected chairman.

A paper, describing a general apparatus stand, written by Mr. A. Robbins, was read by the Registrar, and the clamp with the rod, a ring and bottle support were exhibited to the meeting. The paper was illustrated by a drawing, and the stand

was thought to be well adapted to the purpose designed. On motion it was referred to the Committee on Publication (see page 72).

Mr. B. L. Smedley exhibited an arrangement for manufacturing compressed pills without the trouble and risk of breaking, usually attendant upon removing them from the mould in which they are compressed. The device will be gladly welcomed by those interested. A description and illustration will be found on page 74.

Prof. Maisch presented, on behalf of the British Pharmaceutical Conference, the "Year Book of Pharmacy" and "Transactions of the Conference" to the College for the Library. The Registrar was directed to return the thanks of the College for the courtesy.

Prof. Maisch exhibited the fruit of *Hura crepitans*, Lin., sent to him several years ago from Southern Mexico. It is commonly known as the "Sand-box," on account of its being used for the purpose indicated after the removal of the seeds. The fruit had been sent in the unripe state, and, after having been kept in a warm room, had recently split into the separate carpels with considerable force. The plant belongs to the natural order Euphorbiaceæ; the seeds are flat, disk-like, brown, and are whitish internally, of an oily taste, are used as a purgative, and, externally applied, are said to be useful in rheumatic affections.

Mr. Boring exhibited a sample of what was sold as squill, and upon examination proved to be squill which had been submitted to the action of the drug-mill, and, being moist, had agglutinated into masses.

Carbolate of bromine was exhibited and its composition queried, but no one present was acquainted with the formula for preparing it; it is recommended as a remedy for catarrh.

Mr. Rush read a very interesting paper upon orange-flowers and oranges from the Southern States (see page 68). The paper elicited considerable discussion.

On motion, the meeting adjourned.

THOS S. WIEGAND, *Registrar.*

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

Alumni Association Philadelphia College of Pharmacy.—The Fourth Social Meeting was held at the College Thursday, January 2, 1879, Vice President Procter presiding.

The minutes of the last meeting were read and approved. This being the time announced for the bestowment of the Botanical Prizes, Dr. Murray, for the Prize Committee, reported that two gentlemen had presented collections for examination, but neither had conformed to the rule requiring the specimens to be arranged according to Gray's "Manual." The matter was postponed till the next meeting, in order to give the gentlemen time to make the necessary changes.

A communication was received from the Alpha Phi Society, tendering the thanks of that association for the specimens donated at the last meeting.

Mr. Sayre spoke of the difficulties students encounter when writing their theses for want of proper guides in conducting their investigations. He thought the Alumni Association would be doing a good work if they would, through a committee, publish in pamphlet form some plain rules to follow in making a proximate analysis, as all existing works on the subject are so profound as to puzzle even chemists of some experience.

Mr. Mattison and others spoke strongly in favor of the plan, and the Secretary was instructed to invite Mr. Sayre to be present at the next meeting of the Executive Board in order to bring the subject regularly before them for action.

Mr. Mattison read a paper entitled The Great Geysers of California, and, on motion, the thanks of the meeting were tendered for the interesting communication.

Dr. Murray exhibited some rare specimens of compounds of allyl, ethyl and amyl, which were manufactured by Dr. Greene.

Mr. Procter presented for examination some specimens of officinal preparations, which were all recognized by the students.

Adjourned. W. W. MOORHEAD, *Secretary.*

Cincinnati College of Pharmacy.—At a meeting held January 8, 1879, the following officers and trustees were elected for the ensuing year: President, J. D. Wells; Recording Secretary, A. W. Bain; Corresponding Secretary, Jno. Weyer; Treasurer, Chas. Faust; Trustees, George Egar, R. M. Byrnes, F. L. Eaton and H. H. Koehnken.

The reports of the retiring officers and standing committees showed a lively interest taken by the members in the welfare of the College.

Prof. E. S. Wayne, from the Committee on the Progress of Pharmacy, presented a long report, which was laid over to the first regular pharmaceutical meeting.

The Secretary reported an attendance of 98 students upon the lectures.

The Library Committee reported additions of various foreign and American journals, text-books and pharmacopœias; also, many donations to the Library and Museum, by individuals and by the various departments of the government at Washington, all of which will be of educational and pharmaceutical interest to members and students.

Pharmacy in Indianapolis.—A very full meeting of druggists and pharmacists of Indianapolis was held at the Grand Hotel January 15, to make arrangements for the annual meeting of the American Pharmaceutical Association next September. Dr. Boswell Ward was called to the chair and Eli Lilly appointed secretary. Committees were appointed as follows: Supervisory Board, Messrs. Keilhorn, Perry and Lilly; on Finance, Messrs. Sloan, Emil Martin, Weiss, Dill, Dryer, Traub and Ward; on Railroads, Messrs. J. W. Bryan, Kiefer and Stewart; on Hall, Messrs. Metzner, Martin and Mueller.

The Alumni of the Philadelphia College of Pharmacy residing on the Pacific coast had a social gathering at the Palace Hotel in San Francisco, as the guests of

Henry S. Wellcome, Ph.G. Most of the Alumni and several prominent gentlemen of San Francisco were present. The re-union was a very pleasant one, and after justice had been done to the repast prepared for the occasion, reminiscences of college life were related and toasts proposed to various gentlemen who held or still hold prominent positions in the American Pharmaceutical Association or in the College, of which nearly all the participants are graduates.

EDITORIAL DEPARTMENT.

The Pennsylvania Patent Medicine Tax.—In our last issue (page 57) we have given an account of the decision recently rendered in Pittsburg concerning this tax. We have since been favored with a copy of the *Pittsburg Legal Journal* of January 1st, 1879, in which we find a fuller report, from which it appears that the question was decided by *two courts*, and on account of its importance to our readers in Pennsylvania we insert it in full:

Common Pleas Nos. 1 and 2.

Simon Johnston, Plaintiff in error, v. Commonwealth, Defendant in error; and Joseph Abel, Plaintiff in error, v. Commonwealth, Defendant in error.

These were actions brought by the Treasurer of Allegheny county in the name of the Commonwealth, against the said plaintiffs in error to recover an additional Mercantile License for the sale of patent medicines, under the provisions of the Act of April 10th, 1849, §§ 25 and 26.

The plaintiffs in error are apothecaries, and, with a number of others in the same business, were assessed by the Mercantile Appraiser for said license, but refused to pay, whereupon actions were brought against all of them before various aldermen, and judgment obtained in favor of the Commonwealth. The actions were then removed by *certiorari*—the former, with others, into the Court of Common Pleas No. 2. They came up on the last argument list in each of said courts, and after argument the judgments of the aldermen were reversed by *both courts*, for the reason that the above mentioned Act of 1849, which imposed such additional license, was repealed by the Act of April 22d, 1858, § 9. (P. L. 1858, pages 468-70.)

The Court of Common Pleas No. 2 (Judges Ewing and Kirkpatrick), in deciding the matter, expressed the further opinion that even if the Act of 1849 had not been repealed, the plaintiffs in error would not have been liable, as that act itself clearly excepted regular apothecaries from its operation.

Alfred Kerr, Esq., for plaintiffs in error.

The Preparation of Pepsin.—In the *Southern Medical Record*, issued December 20, 1878, a paper by Jos. Adolphus, M. D., is published on the preparation of pepsin and the good to be obtained from it, which commences as follows:

In 1872 I read an interesting paper on the preparation of pepsin, by an American author whose name I have unfortunately forgotten. The simplicity of the process, the way of obtaining the ferment according to the manipulations of this method, so impressed my attention as to fasten itself on my memory.

We call the attention of the writer to the fact that the process, which is imperfectly described by him, originated with Prof. E. Scheffer, of Louisville, and was published in the February number of the "American Journal of Pharmacy" for 1872.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

The Chemists' and Druggists' Diary, 1879. London, England. 4to.

A number of useful formulas of perfumery, cocmetics, flavoring extracts, etc., and other interesting information are republished.

A Manual of Prescription Writing, etc. By Matthew D. Mann, A.M., M.D, Lecturer on Clinical Microscopy, etc., in the College of Physicians and Surgeons, New York. New York: G. P. Putnam's Sons, 1878. 16mo, pp. 155. Price, 90 cents.

This little work attempts to be more than merely an aid for writing prescriptions grammatically correct, but it covers pretty much the ground of knowledge necessary for the proper formulation, as will be seen from the following brief account of its contents: Definition and parts of a prescription; weights and measures; officinal and non-officinal preparations; grammatical construction of a prescription; list of words and phrases, with pronunciation and proper abbreviations; the various forms for extemporaneous prescriptions (a chapter particularly full of useful information to the physician); doses of medicines; the metric system (a very good and practical exposition of its advantages); medicinal combinations; incompatibility.

Each chapter indicated above has evidently been written with a thorough appreciation of its importance to the young physician, while, at the same time, the wants of the more experienced practitioner have not been lost sight of. Nearly all of them will also be advantageously consulted by apothecaries. The most important shortcoming, if such it can be considered, is, in our opinion, the want of a guide for the proper quantity of very active and poisonous medicines to be given within a day. We appreciate the difficulty and even the impossibility of drawing a line between the allowable and dangerous daily dose; but the difficulty can scarcely be greater than for fixing the single dose, and if the line be drawn at any point we believe that it would render both the physician and pharmacist more careful in overstepping it. The want of such a posological table in our National Pharmacopœia we regard one of the most serious defects of that work.

The Cell Doctrine: its history and present state. For the use of students in medicine and dentistry; also, a copious bibliography of the subject. By James Tyson, M.D., Prof. of General Pathology and Morbid Anatomy in the University of Pennsylvania, etc. Second edition—revised, corrected and enlarged. Philadelphia: Lindsay & Blakiston, 1878. 12mo, pp. 202. Price, $2.00.

The first edition of this work was reviewed in this journal 1870, page 186. All that has been said there in praise of it is equally applicable to the present issue, in which not only a critical re-examination of the original sources of information is apparent, but which bears also abundant evidence that the researches of the numerous investigators in this fascinating department of science up to the time of publication have been carefully examined and accurately reported. The historical accounts of the views entertained by scientists of the origin and development of cells is very appropriately followed by a chapter giving a brief summary and dwelling more especially upon "the present state of the cell doctrine," and likewise embodying the author's views on the same subject. The bibliography occupies over 40 pages, and enumerates the different works published separately and the essays on this subject which have appeared in various journals. The work contains two plates and a number of other illustrations printed in the text. The mechanical portion of the book is very commendable.

Practical Surgery: including surgical dressings, bandaging, ligations and amputations. By J. Ewing Mears, M.D., Demonstrator of Surgery in Jefferson Medical College, etc., with 227 illustrations. Philadelphia: Lindsay & Blakiston, 1878. 12mo, pp. 279. Price, $2.00

The scope of this work is indicated by its title. The author has endeavored to present the subjects in a concise manner, and, at the same time, to omit nothing which might interfere with completeness. The illustrations are mainly reproductions from well-known larger works on surgery, and of improved surgical instruments. The descriptions are clear and to the point, and the volume will be found an excellent and useful addition to the library of the student in surgery.

Recherches sur la digestion, l'assimilation et l'oxydation organique ou vitale. Par M. le docteur Mialhe. Paris: G. Masson, 1879. 8vo, pp. 99.

Researches on digestion, assimilation and organic or vital oxidation.

This essay has been honored with a gold medal by the French Academy of Sciences, April 23, 1877. It is a review of the labors of physiologists and of observations made by the author on the subjects indicated in the title, but more especially with regard to their influence on the secretion of sugar through the urine. The digestion and assimilation of amylaceous, saccharine and albuminous matters and the destruction of the sugar in the organism are considered at length; the modifications or changes, either partial or complete, which the organic acids undergo in the animal economy are reviewed; and, after some remarks on respiration and on the chemical influence upon the animal organism of alkalies and of carbonic acid, the author proceeds to his observations on diabetes mellitus, and urges the employment of alkalies, as well as hygienic and dietetic measures, as the proper remedies for affording relief and effecting a cure.

Etude sur le groupe des aphides et en particulier sur les pucerons du térébinthe et du lentisque. Par L. Courchet, Pharmacier de Première Classe. Montpellier: Boehm et Fils, 1878. 4mo., pp. 16.

Observations on the group of aphidæ, and particularly on the plantlice of the turpentine pistacia and the lentisk.

This is an interesting and very creditable investigation into the development of the aphidae inhabiting the two trees named. The essay is accompanied by three lithographic plates of the third generation of these insects, and of their antennæ, wings and the galls which they produce upon the leaves of the two trees.

Proceedings of the Eighth Annual Meeting of the New Jersey Pharmaceutical Association, held in Elizabeth, May 15, 1878. Camden, N. J. 8vo., pp. 48.

An account of the meeting will be found on p. 316 of our last volume. The pamphlet before us contains the minutes, reports and other matters usually found in such publications, and the following papers which were read at the meeting: Pharmacy *vs.* Quackery, by H. P. Reynolds; Practicality, by D. W. Brant; Hypophosphite of Zinc, a new remedy, by R. W. Gardner, and Syrups of the hypophosphites, by Jas. W. Mercein. The Association numbers about 175 members. The next meeting will be held in Princeton, May 21st next.

Zur Kenntniss einzelner chemischer Bestandtheile der Weiden und deren pathologischen Gebilde, und über einige Reactionen mit Gerbstoffen und denen verwandten Körpern. Von Magister Edwin Johanson

Contributions to the knowledge of some chemical constituents of the willows, and of their pathological excrescences (galls), and on some reactions with tannins and allied compounds.

This is a reprint of an essay published in "Archiv der Pharmacie." The experiments were made in the laboratory of the Pharmaceutical Institute at Dorpat,

where the author is assistant to Prof. Dragendorff. A hitherto unknown compound, somewhat resembling *quercitrin*, was discovered in the willows examined.

Vortrag des Professor Dr. Mohr in der Generalversammlung des Deutschen Apotheker-Vereins zu Coblentz, am 11. Sept., 1878.

Discourse of Prof. Dr. Mohr at the annual meeting of the German Apothecaries' Society at Coblence, Septb. 11, 1878. 8vo., pp. 16.

A very interesting exposition of the relation of pharmacy to chemistry.

Preliminary Notice on Chromometry, a new branch of quantitative analysis with the blowpipe. By Prof. Geo. Aug. König, Ph.D., of the University of Pennsylvania.

This paper, which was read before the American Philosophical Society, describes a method of mineral analysis, which seeks to quantitatively determine elements by the intensity of coloration produced in a borax bead, and is very appropriately named *chromometry*. The paper is accompanied by an engraving of the apparatus.

Berberina Phosphate. By Henry B. Parsons and Theo. J. Wampelmeier. New York: Wm. Wood & Co. 1878.

A reprint of an interesting paper, published in "New Remedies." The authors determined the composition of *berberina phosphate* to be $C_{20}H_{17}NO_4, 7H_3PO_4.4H_2O$; dried at 70°C. the salt was found to be soluble in 10·43 parts, and after drying at 100°C., in 21·52 parts of cold water. The sulphate requires 68 parts.

The receipt of the following pamphlets is herewith acknowledged:

Valedictory Address delivered at the Fifth Annual Commencement of the California College of Pharmacy. By Emlen Painter, Ph.G., Professor of Pharmacy.

Quarterly Report of the Chief of the Bureau of Statistics, Treasury Department, showing imports and exports of the United States, etc., for the three months ended June 30, 1878. Washington: Government Printing Office.

Annual Address delivered before the American Academy of Medicine at Easton, Pa, Sept. 17, 1878, by Frank H. Hamilton, A.M., M.D., President of the Academy, etc.

The Relation of Ozone to Disease. Prize thesis. By Prof. J. F. Baldwin, M.D., Columbus, O.: Charles M. Cott.

Hydrobromic Acid. By De Witt C. Wade, M.D., of Holly, Mich. New York: Wm. Wood & Co.

A Case of Acute Puerperal Inversion of the Uterus. By John Byrne, M.D., of Brooklyn. New York: D. Appleton & Co.

On Feticide. By Prof Henry Gibbons, Sr., M.D. San Francisco, Cal.

The American Medical College Association, second annual meeting, held at Buffalo, N. Y., June 3, 1878. Detroit: Free Press Printing House.

Thirty-sixth Annual Reports of the Board of Visitors, Trustees, Superintendent, Treasurer and Financial Agent of the New Hampshire Asylum for the Insane to the New Hampshire Legislature, June session, 1878. Concord.

Annual Report of the Pennsylvania Free Dispensary for Skin Diseases. From Nov. 1, 1877, to October 31, 1878.

Subcutaneous Injections and Tables of the Metric System with Equivalents. By Chas. J. Powers, of Syracuse, N. Y., assisted by Prof. Francis Engelhardt.

Annual Report of the Western Druggists' Mutual Benefit Association. Cincinnati, 1878.

On page 205 of our last volume, we have called attention to this organization and explained the plan upon which it proposes to carry out its object, w ich is the insurance of the lives of its members. The report now before us accounts for receipts during the year ending November 6, 1878, amounting to $1,605.90, and for disbursements during the same period amounting to $905.20. This latter sum includes all the expenses of organization, such as charter, printing, salary of secretary, etc. The membership of the Association extends over a number of the Western and Atlantic States, and branch organizations have been formed in several large cities with the view of facilitating the business of the Association.

For the city of New York a local board has been organized, comprising such old and well-established houses as McKesson & Robbins, represented by William L. Vennard and T. H. Sherwood; Lazell, Marsh & Gardiner, represented by Prof. P. W. Bedford; Hall & Ruckel, represented by Wm. H. Hall; Caswell, Hazard & Co., represented by R. N. Hazard; S. H. Ambler & Co., represented by Starr H. Ambler, 36 Vesey street; Theo. Ricksecker, 146 and 148 Williams street; A. J. Ditman, cor. Barklay and Broadway; John Newton, of the "Druggists' Circular;" Dr. F. A. Castle, of "New Remedies," cor. 57th street and 4th avenue, with Henry A. Cassebeer, Jr., cor. Ninth street and 4th avenue, as local secretary.

In Philadelphia, the local organization will be represented by Prof. Jno. M. Maisch, Joseph P. Remington, cor. 13th and Walnut streets; Messrs. Edmund A. Crenshaw, William F. McPherson, of Johnston, Holloway & Co.; Joseph Wayne, of Turner & Wayne; Richard V. Mattison, of Keasbey & Mattison, and Henry N. Rittenhouse, of Mellor & Rittenhouse, who is selected as the local secretary for this city.

The object of the Association, the reduction of expenses to the lowest possible figure, and the exceedingly small outlay required for securing the benefits, cannot fail but to commend the Association to the druggists and pharmacists of the United States. The Secretary is Mr. James M. Dodge, Cincinnati.

The Pharmacist and Chemist. Chicago, 1879.

The first number of the twelfth volume of our Western cotemporary comes to us in a new and improved dress, and with its scope extended so as to cover, besides pharmacy and chemistry, also therapeutics and the allied sciences. As heretofore, it is issued monthly, at $1.50 per year. Commencing with the present volume, the Chicago College of Pharmacy has placed it in charge of a publishing committee, and the various labors connected with the publication have been apportioned by appointing F. M. Goodman, Ph.G., editor, Matt. W. Borland, manager of the subscription department, and Henry Biroth, manager of the advertising department.

Index Medicus; a monthly classified record of the current medical literature of the world. Compiled under the supervision of Dr. John S. Billings, Susgeon U. S. Army, and Dr. Rob. Fletcher, M.R.C.S., Eng. New York: F. Leypoldt, Publisher. Price, $3 00 per year.

This new periodical will record the titles of all medical books and of all valuable original articles published in medical and allied journals in English and other languages, the whole material to be classified under appropriate subject headings. The importance of this enterprise is readily understood by the physician, and though interested to a more limited extent, the intelligent pharmacist will likewise find the Index Medicus of great value. That the work will be well performed does not

admit of any doubt, when it is remembered that the chief editor, Dr. Billings, who is in charge of the National Medical Library at Washington, has prepared a "National Catalogue of Medical Literature," which has been most favorably commented upon by all who have examined the manuscript or had occasion to consult the portion which was published a few years ago.

The National Dispensatory. By Professors Alfred Stillé and John M. Maisch. Philadelphia: Henry C. Lea.

On going to press, we are informed that the index of this work is now in the hands of the printer, and the book will be issued in a few days.

OBITUARY.

BENJAMIN LYMAN, senior member of the firm of Lymans, Clare & Co., of Montreal, and of Lyman Brothers, of Toronto, Canada, died in the latter city December 5, 1878, of inflammation of the lungs. He war born at Derby, Vermont, in 1810, and when a young boy came with his parents to Montreal, where he entered the drug business established in 1803 by his uncle, Dr. M. J. Lyman, and with which establishment he has been connected ever since. His extensive business relations did not prevent him from taking a lively interest in all public affairs of the city where he resided, and he warmly supported the various movements made in Canada for the elevation of pharmacy. The deceased leaves a widow, two sons and two daughters.

PROFESSOR JOHN B. BIDDLE, M. D., died in his native city, Philadelphia, January 19th. He was born in 1815, graduated at the University of Pennsylvania, and, in 1865, was called to the chair of Materia Medica and Therapeutics in the Jefferson Medical College, which position he held at the time of his death. The deceased was widely and favorably known and was the author of a work entitled "Materia Medica for the Use of Students," which has been adopted as a text book in many medical colleges.

DR. JACOB BIGELOW died in Boston on January 10th, at the age of 91 years. He graduated from Harvard College in 1806, published the *Florula Bostoniensis* in 1815, and a few years afterwards his illustrated *American Medical Botany*, was elected Professor in 1815, and inaugurated or participated in various movements of educational interest and hygienic importance. The deceased was one of those prominent men whose lives are intimately connected with the early history of medicine in this country. He was the oldest member of the Massachusetts Medical Society, and was an honorary member of the Philadelphia College of Pharmacy.

EDWARD T. HEHR died suddenly at Hazleton, Pa., on Christmas day, 1878. He was born at Minersville, Pa., and graduated in 1871 at the Philadelphia College of Pharmacy.